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The Diagnostic Rhyme Test (DRT): An Air Force Implementation

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The Diagnostic Rhyme Test (DRT) for intelligibility of voice communications systems has been implemented at the Air Force Voice Processing Facility, Hanscom AFB, Massachusetts. This report describes the recruiting and training of listeners and the usage of software to score the DRT. In addition, performance of the in-house DRT is described. It is concluded that the in-house DRT is an economical measure of intelligibility that yields highly reliable results and adequately discriminates small differences in intelligibility. It is further concluded that in-house DRT results are comparable to

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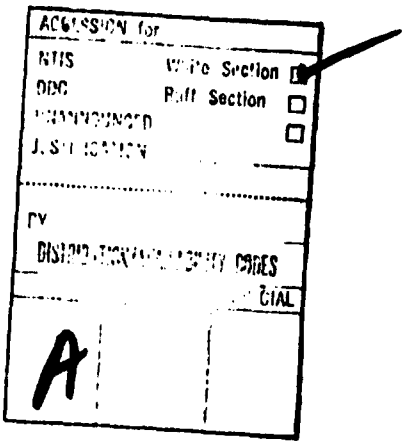

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1. INTRODUCTION

The Diagnostic Rhyme Test (DRT)[1] for intelligibility was initially developed under Contract No. F19628-70-C-0182 for the Air Force Electronic Systems Division, Voice Processing Laboratory (formally part of the Air Force Cambridge Research Laboratories, Data Sciences Laboratory). In recent years the DRT has emerged as a DoD Standard for testing the intelligibility of voice communications terminals. This is evidenced by its extensive use by the DoD Narrowband Secure Voice Consortium during its FY75 and FY76 Test and Evaluation of candidate narrowband digital voice algorithms for use in the 1980's. The DRT's used by the Consortium were evaluated under contract by Dynastat, Inc., Austin, Texas, the developers of the test. This report documents the development of an in-house capability to administer and score the DRT.

(Received for publication 16 June 1978)

1. Voiers, W.D., Sharpley, A.D., and Hehmsoth, C.J. (1973) Research on Diagnostic Evaluation of Speech Intelligibility, AFCRL-72-0694.

2. THE DIAGNOSTIC RHYME TEST

2.1 Introduction

The DRT is a test for intelligibility rather than user acceptance, or quality, of voice systems. Although related, it is important to note the distinction between intelligibility and quality. It is possible for a voice system to be perfectly intelligible yet have a very unnatural sound or not permit speaker recognition. In such a case the system is likely not to be acceptable to the user. On the other hand, a system having poor intelligibility will certainly be unacceptable to the user. Thus, a prerequisite for user acceptance is high intelligibility. The DRT is a measure of that characteristic of a voice system. The test is structured in such a way as to allow a detailed analysis of the ability of a system to reproduce certain classes of phonemes. These classes are categorized by the binary attributes VOICING, NASALITY, SUSTENTION, SIBILATION, GRAVENESS, and COMPACTNESS. The test provides a means of measuring the performance of the voice system for each state, present or absent, of these six attributes as well as total intelligibility. Using these results, specific weaknesses in the voice system can be pinpointed and corrected. This method of diagnostic analysis has been successfully used.[2,3]

2.2 Usage

A series of master tape recordings have been prepared by Dynastat, Inc. under various Government contracts to be used as input speech material for testing the intelligibility of the voice system under consideration. Each tape recording consists of one or more speakers uttering a known randomized sequence of words. Each word has been selected from a pair of rhyming words differing only in the leading consonant. Figure 1 presents the sequence of events for DRT usage. In order to conduct a DRT one or more master tape recordings are used as input speech material to the voice system under test. The processed output speech is tape recorded for later presentation to a crew of listeners for evaluation. The listeners' task is to determine which of the rhyming words had been uttered by the speaker. After all tape recordings processed by the system under test have been heard by the listening crew, computer analysis of the listeners' responses takes place and a comprehensive printout of the results is provided. Further analysis by the user can then take place.

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2. Smith, C. P. (1976) Comparative Evaluations of Speech Intelligibility Performance of Three Narrowband Voice Communications Methods: Trivoc, Linear Prediction Coding (LPC) and Piecewise Linear Prediction Coding (PLPC) ESD-TR-77-131.

3. Smith, C. P. (1977) Intelligibility Performance of Narrowband Linear Predictive Vocoders in the Presence of Bit Errors, ESD-TR-77-328.

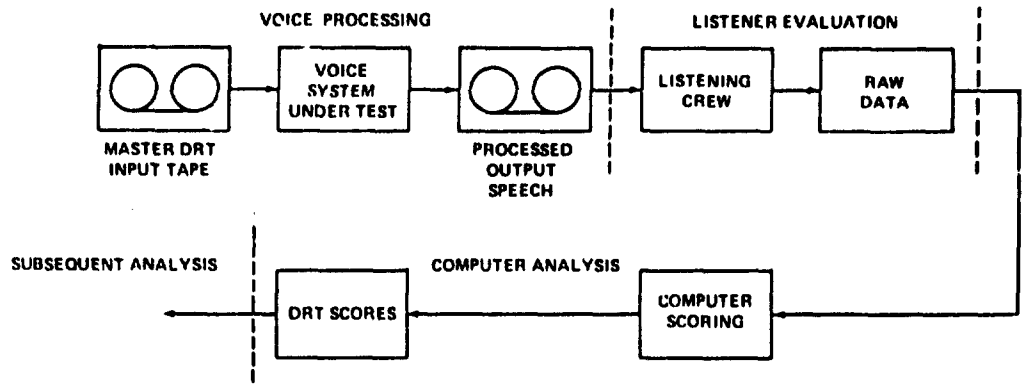


Figure 1. DRT Usage. The sequence of events

2.3 Structure of the DRT

A complete DRT consists of one speaker uttering 464 words of which 384 words are actually scored. The remainder are filler and experimental words. DRT's are normally administered in half tests (192 words) using multiple speakers. The complete list of words used in the DRT appear in Figures 2a through 2d. The DoD Narrowband Secure Voice Consortium has prepared a set of DRT master input tapes using various microphones and ambient acoustic noise backgrounds. These tapes are in the possession of this office and are available for DRT testing. Table 1 is a summary of these tapes. In addition, master DRT tapes as indicated in Tables 3, 4, and 5 are also available.

2.3.1 THE TEST BOOKLET

Each listener who is tasked to evaluate a processed tape recording has before him a four page test booklet for each speaker he will hear. The booklet is sufficient to score one half test. The booklet is shown in Figures 2a through 2d. The speech material the listener hears consists of 232 words uttered by each speaker. The words are one word from each of the word pairs in the test booklet. The listener is instructed to strike out the word he thinks he hears. The booklet is structured so that the word pairs on Figures 2a and 2c are the same but presented in the reverse order. Similarly, the word pairs on Figures 2b and 2d are the same but appear in reverse order. In addition, the present state of each of the six attributes are represented by the left word in each column on Figures 2a and 2b while the absent state is represented by the right word in each column on those pages. The reverse is true for Figures 2c and 2d.

Table 1. Available Master DRT Tapes

Tape ID	DRT TAPES Speaker / List	*Environment	**Microphone 1	2	3	4	5	6
E-1-A	LL 302A, CH 308B, RH 310A	Quiet	X	X	X	X		
E-1-B	JE 306A, BV 303A, PK 309A	"	X	X	X	X		
E-2-A	LL 302B, CH 307A, RH 310B	"	X	X	X	X		
E-2-B	JE 306B, BV 303B, PK 312B	"	X	X	X	X		
E-3-A	LL 301A, CH 308A, RH 311A	"	X	X	X	X		
E-3-B	JE 305A, BV 304A, PK 312A	"	X	X	X	X		
E-4-A	LL 301B, CH 307B, RH 311B	"	X	X	X	X		
E-4-B	JE 305B, BV 304B, PK 309B	"	X	X	X	X		
E-5-A	JS 317A, LS 315A, MP 314A	"	X	X	X	X		
E-5-B	JS 317B, LS 315B, MP 314B	"	X	X	X	X		
E-6-A	JS 318A, LS 316A, MP 313A	"	X	X	X	X		
E-6-B	JS 318B, LS 316B, MP 313B	"	X	X	X	X		
G-1-A	RH 318A, JE 310A, CH 314A	ABCP	X		X		X	
G-1-B	RH 318B, JE 310B, CH 314B	"	X		X		X	
G-2-A	RH 317A, JE 309A, CH 313B	HEL	X		X			X
G-2-B	RH 317B, JE 309B, CH 313A	"	X		X			X
G-3-A	RH 303A, JE 311A, CH 315A	SHIP	X		X		X	
G-3-B	RH 303B, JE 311B, CH 315B	"	X		X		X	
G-4-A	RH 304A, JE 312A, CH 316A, JS 305A	Office	X		X		X	
G-4-B	RH 304B, JE 312B, CH 316B, JS 305B	"	X		X		X	

*Environment: Ambient Acoustic Noise Simulated in a Sound Room.
ABCP - Airborne Command Post
HEL - Helicopter
SHIP - Shipboard

** See Table 2 for microphone identification.

Table 2 Microphone Identification Used in Table 1.

1 - Altec 659A Dynamic Microphone
2 - Western Electric T1 Carbon Microphone
3 - Grason-Stadler E7300M Throat Microphone
4 - General Radio 1560-P5 Ceramic Studio Microphone
5 - Roanwell Dynamic Noise Cancelling Microphone
6 - Electrovoice M-78/AIC Dynamic Helicopter Microphone

Table 3 Available Word Lists and Speakers (100 Series)

Word List	Speaker	Word List	Speaker
102A	BV	108A	CH
102B	BV	108B	CH
103A	BV	111A	JE
103B	BV	111B	JE
104A	RD	112A	SN
104B	RD	112B	SN
105A	RD	113A	JE
105B	RD	113B	JE
106A	BL	115A	SN
106B	BL	115B	SN
107A	CH	116A	BL
107B	CH	116B	BL

Table 4. E-4a Advanced Airborne Command Post Master DRT Tapes

Tape ID	DRT Tapes Speaker/List	Environment	*Microphone 1	2	3	4	5
S-1-A	SM 301A, SK 307A, BD 311A	Quiet	X	X	X	X	
S-1-B	HH 303A, MM 305A, IP 309A	Quiet	X	X	X	X	
S-2-A	SM 301B, SK 307B, BD 311B	Quiet	X	X	X	X	
S-2-B	HH 303B, MM 305B, IP 309B	Quiet	X	X	X	X	
T-1-A	SM 302A, SK 308A, BD 312A	E-4A Noise	X	X	X		X
T-1-B	HH 304A, MM 306A, IP 310A	E-4A Noise	X	X	X		X
T-2-A	SM 302B, SK 308B, BD 312B	E-4A Noise	X	X	X		X
T-2-B	HH 304B MM 306B, IP 310B	E-4A Noise	X	X	X		X

*Microphones:

1 - ALTEC 659A Dynamic Microphone

2 - Roanwell Confidencer Microphone P/N 240100001

3 - Grason-Stadler E7300M Throat Microphone

4 - General Radio 1560-P5 Ceramic Studio Microphone

5 - Noise only - General Radio 1560-P5

Table 5. E-3A AWACS Master DRT Tapes

Tape ID	DRT Tapes Speaker/List	Environment	*Microphone 1	2	3	4	5
S-3-A	CH 301A, JE 305A, SM 309A	Quiet	X	X	X	X	
S-3-B	IP 303B, MC 307A, GM 311A	Quiet	X	X	X	X	
S-4-A	CH 301B, JE 305B, SM 309B	Quiet	X	X	X	X	
S-4-B	IP 303A, MC 307B, GM 311B	Quiet	X	X	X	X	
T-3-A	CH 302A, JE 306A, SM 310A	E-3A Noise	X	X	X		X
T-3-B	IP 304A, MC 308A, GM 312B	E-3A Noise	X	X	X		X
T-4-A	CH 302B, JE 306B, SM 310B	E-3A Noise	X	X	X		X
T-4-B	IP 304B, MC 308B, GM 312A	E-3A Noise	X	X	X		X

*Microphones:

1 - ALTEC 659A Dynamic Microphone

2 - H-335/A1C Headset Microphone

3 - Grason-Stadler E7300M Throat Microphone

4 - General Radio 1560-P5 Ceramic Studio Microphone

5 - Noise only - General Radio 1560-P5

DRT !'' Nr.

(A)

ROW		
1	GOB – BOB	COOT – TOOT
2	DAUNT – TAUNT	BOND – POND
3	MOOT – BOOT	MOAN – BONE
4	SHEET – CHEAT	VILL – BILL
5	JAB – GAB	JEST – GUEST
6	POT – TOT	FOUGHT – THOUGHT
7	GHOST – BOAST	COOP – POOP
8	LIP – RIP	LEAP – REAP
9	ZED – SAID	VAST – FAST
10	GNAW – DAW	KNOCK – DOCK
11	SHOES – CHOOSE	THOSE – DOZE
12	CHEEP – KEEP	SING – THING
13	BANK – DANK	MET – NET
14	GOT – DOT	CAUGHT – TAUGHT
15	LOAD – ROAD	LEWD – RUDE
16	DINT – TINT	BEAN – PEEN
17	NECK – DECK	MAD – BAD
18	THONG – TONG	VOX – BOX
19	CHOO – COO	JOE – GO
20	WEED – REED	BID – DID
21	SHAG – SAG	YEN – WHEN
22	LOT – ROT	LAW – RAW
23	VOLE – FOAL	ZOO – SUE
24	NIP – DIP	NEED – DEED
25	FENCE – PENCE	THAN – DAN
26	SAW – THAW	CHOP – COP
27	POOL – TOOL	FORE – THOR
28	YIELD – WIELD	HIT – FIT
29	LAP – RAP	LEST – REST

Name _____ Date / Time _____

Figure 2a. DRT Test Booklet

DRT IV Nr.

(B)

ROW		
1	PEST – TEST	FAN – PAN
2	VAULT – FAULT	JOCK – CHOCK
3	NEWS – DUES	NOTE – DOTE
4	VEE – BEE	THICK – TICK
5	SANK – THANK	CHAIR – CARE
6	WAD – ROD	BONG – DONG
7	SHOW – SO	YOU – RUE
8	LID – RID	LEEK – REEK
9	DENSE – TENSE	GAFF – CALF
10	MOSS – BOSS	MOM – BOMB
11	FOO – POOH	THOUGH – DOUGH
12	ZEE – THEE	JILT – GILT
13	FAD – THAD	PENT – TENT
14	HOP – FOP	YAWL – WALL
15	LOW – ROW	LOOT – ROOT
16	GIN – CHIN	VEAL – FEEL
17	MEND – BEND	NAB – DAB
18	SHAW – CHAW	VON – BON
19	JUICE – GOOSE	SOLE – THOLE
20	PEEK – TEAK	FIN – THIN
21	GAT – BAT	KEG – PEG
22	LOCK – ROCK	LONG – WRONG
23	GOAT – COAT	DUNE – TUNE
24	MIT – BIT	MEET – BEET
25	THEN – DEN	SHAD – CHAD
26	JAWS – GAUZE	JOT – GOT
27	MOON – NOON	BOWL – DOLE
28	KEY – TEA	GILL – DILL
29	LAMP – RAMP	LEND – REND

Name _____ Date / Time _____

Figure 2b. DRT Test Booklet

DRT IV Nr.

(C)

ROW		
1	BOB – GOB	TOOT – COOT
2	TAUNT – DAUNT	POND – BOND
3	BOOT – MOOT	BONE – MOAN
4	CHEAT – SHEET	BILL – VILL
5	GAB – JAB	GUEST – JEST
6	TOT – POT	THOUGHT– FOUGHT
7	BOAST – GHOST	POOP – COOP
8	RIP – LIP	REAP – LEAP
9	SAID – ZED	FAST – VAST
10	DAW – GNAW	DOCK – KNOCK
11	CHOOSE – SHOES	DOZE – THOSE
12	KEEP – CHEEP	THING – SING
13	DANK – BANK	NET – MET
14	DOT – GOT	TAUGHT – CAUGHT
15	ROAD – LOAD	RUDE – LEWD
16	TINT – DINT	PEEN – BEAN
17	DECK – NECK	BAD – MAD
18	TONG – THONG	BOX – VOX
19	COO – CHOO	GO – JOE
20	REED – WEED	DID – BID
21	SAG – SHAG	WREN – YEN
22	ROT – LOT	RAW – LAW
23	FOAL – VOLE	SUE – ZOO
24	DIP – NIP	DEED – NEED
25	PENCE – FENCE	DAN – THAN
26	THAW – SAW	COP – CHOP
27	TOOL – POOL	THOR – FORE
28	WIELD – YIELD	FIT – HIT
29	RAP – LAP	REST – LEST

Name _____ Date/Time _____

Figure 2c. DRT Test Booklet

DRT IV Nr.

(D)

ROW		
1	TEST – PEST	PAN – FAN
2	FAULT – VAULT	CHOCK – JOCK
3	DUES – NEWS	DOTE – NOTE
4	BEE – VEE	TICK – THICK
5	THANK – SANK	CARE – CHAIR
6	ROD – WAD	DONG – BONG
7	SO – SHOW	RUE – YOU
8	RID – LID	REEK – LEEK
9	TENSE – DENSE	CALF – GAFF
10	BOSS – MOSS	BOMB – MOM
11	POOH – FOO	DOUGH – THOUGH
12	THEE – ZEE	GILT – JILT
13	THAD – FAD	TENT – PENT
14	FOP – HOP	WALL – YAWL
15	ROW – LOW	ROOT – LOOT
16	CHIN – GIN	FEEL – VEAL
17	BEND – MEND	DAB – NAB
18	CHAW – SHAW	BON – VON
19	GOOSE – JUICE	THOLE – SOLE
20	TEAK – PEEK	THIN – FIN
21	BAT – GAT	PEG – KEG
22	ROCK – LOCK	WRONG – LONG
23	COAT – GOAT	TUNE – DUNE
24	BIT – MIT	BEET – MEET
25	DEN – THEN	CHAD – SHAD
26	GAUZE – JAWS	GOT – JOT
27	NOON – MOON	DOLE – BOWL
28	TEA – KEY	DILL – GILL
29	RAMP – LAMP	REND – LEND

Name _____ Date/Time _____

Figure 2d. DRT Test Booklet

2.3.2 THE MAJOR ATTRIBUTES

The six attributes tested by the DRT are VOICING, NASALITY, SUSTENTION, SIBILATION, GRAVENESS, and COMPACTNESS. Each of the 192 word pairs in a half-test has been selected so that the leading consonant differs only in the present or absent state of a single attribute. The particular attribute tested by each word pair is shown in Figure 3. The 1st, 8th, 15th, 22nd and last words in each column are not scored. These words are included to allow time for turning pages, moving to the top of the next column, and for inclusion of experimental words. A couple of examples will serve to clarify this.

Example 1. In Figure 2a, the 11th word pair in the left hand column is SHOES-CHOOSE. In Figure 3, the attribute corresponding to the 11th word pair is SUSTENTION. Thus, the word pair SHOES-CHOOSE tests the attribute SUSTENTION. Further, since this word pair is shown on the first page of the booklet, the leading consonant in SHOES exhibits the present state of the attribute while the leading consonant of the word CHOOSE exhibits the absent state of the attribute, thus, SHOES represents a SUSTAINED consonant while CHOOSE represents an ABRUPT consonant.

Example 2. In Figure 2d, the third word pair in the right column is DOTE-NOTE. From Figure 3, it can be seen that this word pair tests the attribute NASALITY. Since this word pair is shown on the fourth page of the booklet, we observe that DOTE represents the absent state of NASALITY (Non-Nasal) while NOTE represents the present state of NASALITY (Nasal).

2.3.3 THE SUB-FEATURES

The following constraints were observed in constructing the set of test words:

(a) Half of the items designed to test VOICING are fricatives; the other half are stop consonants,

(b) Half of the NASALITY phoneme pairs are grave; the rest acute,

(c) Half of the SUSTENTION items are voiced; half unvoiced,

(d) Half of the phoneme pairs that test SIBILATION are voiced, the remainder unvoiced,

(e) Half of the GRAVENESS test items are voiced; the other half unvoiced,

(f) Half of the COMPACTNESS items are voiced; the remainder unvoiced.

Row		
1	Filler	Filler
2	Voicing	Voicing
3	Nasality	Nasality
4	Sustention	Sustention
5	Sibilation	Sibilation
6	Graveness	Graveness
7	Compactness	Compactness
8	Experimental	Experimental
9	Voicing	Voicing
10	Nasality	Nasality
11	Sustention	Sustention
12	Sibilation	Sibilation
13	Graveness	Graveness
14	Compactness	Compactness
15	Experimental	Experimental
16	Voicing	Voicing
17	Nasality	Nasality
18	Sustention	Sustention
19	Sibilation	Sibilation
20	Graveness	Graveness
21	Compactness	Compactness
22	Experimental	Experimental
23	Voicing	Voicing
24	Nasality	Nasality
25	Sustention	Sustention
26	Sibilation	Sibilation
27	Graveness	Graveness
28	Compactness	Compactness
29	Experimental	Experimental

Figure 3. Attribute Tested-Word Pair Position

Figure 4 can be used in conjunction with Figures 2a-d and 3 to determine exactly which word pairs are presented with the sub-features indicated above. A plus (+) in Figure 4, indicates that the two words exhibit the present state of the sub-feature; a minus (-) the absent state. The sub-feature assignments are the same for pages 1 and 3 of the DRT test booklet as well as for pages 2 and 4. The columns of pluses and minuses in Figure 4, correspond to the columns of word pairs in the DRT test booklet. Notice that in Figure 3 each major attribute is tested four times in each column. Thus, there are four pluses and minuses in each column for each major attribute in Figure 4. The following examples will serve to illustrate the use of Figures 2a-d, 3, and 4 to determine the major attribute and sub-feature of each word pair.

Page No.	VOICING	NASALITY	SUSTENTION	SIBILATION	GRAVENESS	COMPACTNESS
1&3	- -	+ +	- +	+ +	- -	+ -
	+ +	- -	- +	- -	+ +	+ -
	- -	- +	- +	- +	+ +	- +
	+ +	- -	- +	- -	- -	+ -
2&4	+ +	- -	+ -	- -	+ +	- +
	- -	+ +	- +	+ +	- -	- +
	+ +	+ -	- +	+ -	- -	+ -
	- -	+ +	+ -	+ +	+ +	- +

Main Attribute	Sub-Feature (+/-)
Voicing	Frictional/Non-Frictional
Nasality	Grave/Acute
Sustention	Voiced/Unvoiced
Sibilation	Voiced/Unvoiced
Graveness	Voiced/Unvoiced
Compactness	Voiced/Unvoiced

Figure 4. Sub-Feature State Location in Test Booklet

Example 1. The second word pair shown on page 1 of the DRT test booklet (Figure 2a) in the left column is DAUNT-TAUNT. Figure 3 indicates that this word pair tests the attribute VOICING. Since this word pair is shown on page 1, (Figure 2a) we conclude that DAUNT represents the voiced case and TAUNT represents the unvoiced case. Referring to Figure 4, we observe that the first pair of words in the left hand column of page 1 of the DRT test booklet that tests the attribute VOICING exhibit the absent (-) state of the sub-feature. That is, the words DAUNT and TAUNT are non-frictional. The word pair ZED-SAID shown on page 1 (Figure 2a) also tests the VOICING attribute. However, these words are frictional.

This can be observed by noting that they are the second word pair in the left column shown on page 1 (Figure 2a) that tests the attribute VOICING. Figure 4 indicates that these two words are frictional (+).

Example 2. The 17th word pair shown on page 4 of the DRT test booklet (Figure 2d) in the right column is DAB-NAB. From Figure 3, we ascertain that this word pair tests the attribute NASALITY. Further, since this word pair is shown in page 4 (Figure 2d), we conclude that DAB is non-nasal and NAB is nasal. The sub-feature for NASALITY is graveness. Referring to Figure 4 we see that the third word pair in the right column shown on page 4 (Figure 2d) that tests the attribute NASALITY exhibits the absent (-) state of the sub-feature graveness. Thus the leading consonant of the word DAB is non-nasal and acute while the leading consonant of the word NAB is nasal and acute. In contrast, the 17th word pair in the left column shown on page 4 (Figure 2d) is BEND-MEND. This pair also tests NASALITY. Figure 4 indicates that these words are grave (+).

2.3.4 THE WORD LISTS

The words in Figures 2a-d have been spoken by each speaker in a predetermined sequence called a word list. Each word list is identified by a three digit number followed by the letter A or B. The letter A is used to identify the first half of the DRT and B to identify the second half. Tables 1, 3, 4, and 5 contain summaries of word lists available and the associated speaker's initials. Appendix A contains the actual word lists.

3. EARLY IN-HOUSE DEVELOPMENT

3.1 Rationale

The DRT has proven itself to be a useful diagnostic tool for finding weaknesses in narrowband digital voice processing algorithms. However, the cost of a DRT using contractor resources was considered too high (approximately $550.00 for a six speaker DRT in FY 78) to make it practical for testing the many algorithm changes required on a week to week basis. In addition, the cost was too high to repeat the test for each configuration in order to obtain estimates of measurement errors needed for a complete statistical analysis (that is, Analysis of Variance[4]). It was determined that DRTs could be conducted at the Air Force Voice Processing Facility, Hanscom Air Force Base using existing hardware for approximately one-tenth the contractor cost, excluding the scoring software development costs. In-house resources were to be used to develop the software.

4. Guenther, W.C. (1964) Analysis of Variance, Prentice-Hall, Inc., Englewood Cliffs, N.J.

3.2 Scoring Software – CSP-30 Implementation

The DRT scoring software was written in FORTRAN IV and implemented on the CSP-30 High Speed Signal Processor. Figure 5 shows flow charts of the scoring programs as implemented on the CSP-30. The program listing and a sample printout of the test results for a two-speaker, two-listener DRT are contained in Appendix B.

3.2.1 PROGRAM USAGE

The scoring software as implemented on the CSP-30 requires manual data entry via the ADDS Video Terminal. The program is used as follows:

a. Load the 32K FORTRAN MIOCS.

b. Load the DRT Scoring Program (Cartridge Output).

c. Run at starting address = 0.

d. Be sure line printer is on-line.

e. The ADDS terminal will display:

INSERT 150 FT CARTRIDGE IN UPPER DECK

I/O RESET - CONTINUE.

Be sure the cartridge is write enabled. Insert it into the upper Tri-Data deck.

f. After carrying out the above instructions the ADDS terminal will display:

SYSTEM UNDER TEST?

SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS

Input up to 50 ASCII characters to identify the system under test, date, etc.

g. ADDS will display:

HOW MANY LISTENERS?

LL

Input an integer from 1 to 12 in I2 format.

h. ADDS will display:

HOW MANY SPEAKERS?

SS

Input an integer from 1 to 6 in I2 format.

i. For I = 1 to the number of listeners the ADDS will display:

LISTENER I NAME

NNNNNNNNNNNNNNNNNNNNNN

Input up to 24 ASCII characters to identify the listener.

The following steps j through r will occur for each listener I and each speaker J:

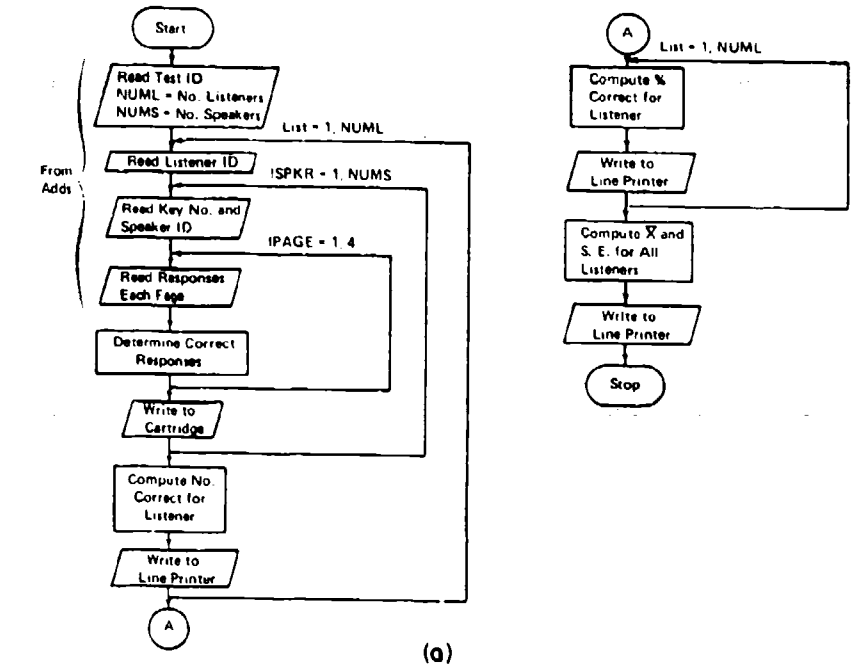
j. ADDS will display:

FOR LISTENER I SPEAKER J

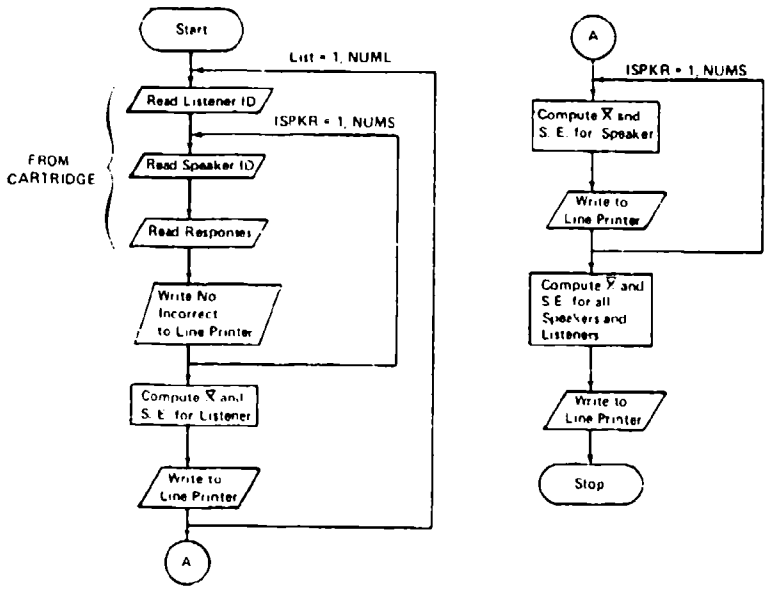
ENTER KEY NUMBER AND LETTER

NNNL

Enter the word list number in I3 format followed by the suffix letter in ASCII.



(a)



(b)

Figure 5. DRT Scoring

k. If no such key is in the program the ADDS will display:

*******NO KEY XXXA*******

where XXXA is the key entered: The program will go to step j above. If the key is a valid one in the 100 series, the ADDS will display:

KEY = XXXA SPEAKER

IF OK ENTER Ø

where XXXA is the key entered and SPEAKER is the speaker identification associated with that key as stored in the program. However, if the key entered is a 300 series key, the ADDS will display:

SPEAKER?

SS

Enter two (2) ASCII characters identifying the speaker. ADDS will then display:

KEY = XXXA SPEAKER

IF OK ENTER Ø

If anything other than Ø is entered the program returns to step j above. Steps 1 through p below occur for each page, K= 1, 2, 3, 4 of the answer booklet (see Figures 2a through 2d).

l. ADDS will display:

FOR KEY XXXA LISTENER I PAGE K ENTER RESPONSE BY COLUMNS

1 = FIRST WORD 2 = SECOND WORD

RRRRRRRRRRRRRRRRRRRRRRRRRRR

For the first column of each word pair on page K of listener I's answer book enter a 1 if the first word of the pair was selected or a 2 if the second word was selected. After the first column has been entered hit new line. Enter the second column in the same way.

m. ADDS will display a graphic representation of the first 15 rows of the page just entered. An example is:

```
 1  XXXXX                 XXXXX
 2  XXXXX                       XXXXX
 3            XXXXX             XXXXX
 4            XXXXX       XXXXX
 5            XXXXX       XXXXX
 6  XXXXXXXXXXXXXXX             XXXXX
 7  XXXXX                       XXXXX
 8  XXXXX               XXXXX
 9            XXXXX     XXXXX
10            XXXXX     XXXXX
11            XXXXX             XXXXX
12  XXXXXXXXXXXXXXX             XXXXX
13  XXXXX                       XXXXX
14  XXXXX               XXXXX
15  XXXXX                       XXXXX
IF  OK ENTER Ø
```

This allows you to check for errors in key punching the entries of the first 15 rows. Notice that rows 6 and 12 in column 1 contain X's in both first and second word

positions. This indicates that something other than 1 or 2 was entered in those positions and corrections should be made.

n. If no corrections are needed enter Ø followed by new line. Anything other than Ø implies a correction is to be made. ADDS will display:

ROW AND COLUMN TO CHANGE? ENTER 999 TO CHANGE ENTIRE PAGE
RRC

Enter the row number in I2 format followed by the column number in I1.

o. If 999 was entered program will go to step 1 above. If a row outside the range 1 to 29, other than 99, or a column other than 1 or 2 is entered, program goes to step n above. If row and column are within the specified range, ADDS displays:

NEW ENTRY?
R

Enter a 1 or 2. Program goes to step m above.

p. After corrections to rows 1 through 15 are made, rows 16 through 29 are displayed and corrected in a similar manner. (NOTE: Corrections to any row can be made regardless of the rows being displayed.)

q. After all pages for listener I, key XXXA have been scored, the next speaker is scored in the same way. After all speakers for listener I have been scored the data is output to the cartridge and a printout of listener I's correct responses is made.

r. The next listener is scored in the same way.

s. After all listeners have been scored, a percent correct printout is made for each listener using the transformation

$$\text{SCORE} = \frac{R-W}{T} \times (100)$$

Where R = Number correct
W = Number incorrect
T = Total number of items

t. A summary of all scores and standard errors across listeners is then printed (see Appendix B). Program stops.

u. Load the DRT Scoring Program (Cartridge Input).

v. Run at starting address = Ø.

w. ADDS will display:

INSERT CARTRIDGE IN UPPER DECK
I/O RESET-CONTINUE

Insert the cartridge containining the DRT data into the upper Tri-Data deck. After hitting I/O Reset and Continue, the program will execute as in Figure 5b. A comprehensive printout of DRT results will be made as shown in Appendix B. No further interaction with the ADDS terminal is required.

3.3 Listeners

It was considered crucial to the success of the in-house DRT program that sufficient numbers of listeners be recruited and that their performance on the DRT be consistent. The reliability of the DRT as a useful tool in measuring intelligibility so that meaningful comparisons between voice systems can be made is dependent on the repeatability of the scores. That is, if a particular DRT is administered to a crew of listeners at different points in time, are the results different? If they are, the credibility of the test is in question. It has been shown that the DRT is highly reliable in this regard if a properly selected and trained listening crew is used.[5]

In addition, for the in-house DRT program to be of maximum utility, the results obtained should be comparable to those obtained by others who administer the same test to their listeners. In particular, we felt it essential that in-house DRT results be comparable to those obtained by Dynastat, Inc.

During the period February-October 1976, 21 volunteer listeners participated in DRT tests to determine the feasibility of implementing an in-house DRT program. The volunteers were recruited from the Hanscom AFB community. They consisted of U.S. Air Force military, civilian employees, military dependents and in-house contractor personnel. Each listener was subjected to a pure tone audiometric test for hearing loss and passed the requirements for an H-1 profile as specified in AFM 160-1 (C9) Attachment 3, 2 May 1975. During the period February-March 1976 four listening sessions were conducted. Each session was approximately two hours in duration. From four to seven listeners participated in each session. The purpose of this initial trial period was to gain some insight into the feasability of conducting in-house DRTs and to determine if comparability with contractor results can be obtained. A second trial period consisting of three sessions was conducted in October 1976. The purpose of this trial period was to measure the repeatability of scores for in-house DRTs and to detect any significant learning trends when a listener is repeatedly exposed to the same test. Seven listeners were used during this second trial period. All but two had been used in the previous tests.

3.3.1 COMPARABILITY

Tables 6a to 6c contain summaries of the results of in house listening Sessions 2, 3, and 4 conducted during February and March 1976 as well as Dynastat scores for the same DRT tapes. The systems used in the tests were all vocoders at various narrowband data rates. Only those scores for listeners who participated in two or more sessions are reported. Session 1 is not included because it served as an orientation for the listeners. The tables also include 95 percent confidence intervals

5. Voiers, W. D. (1965) Performance Evaluation of Speech Processing Devices II. The Role of Individual Differences, AFCRL-66-24.

based on the Dynastat means and standard errors. In addition, the differences between in-house and Dynastat means are included. Those in-house mean scores that lie outside the confidence interval are marked with an asterisk (*). Some observations follow:

a. No attempt was made to screen and eliminate listeners for the purpose of improving in-house means.

b. Of the listeners used in this trial period only two participated in three sessions. All others participated in two or fewer sessions.

c. The general tendency for in-house scores was to approach Dynastat scores as listeners gained experience. In the second listening session seven in-house means fell below their confidence intervals while six fell below their confidence intervals for Sessions 3 and 4. The median difference between in-house and Dynastat means improved from -3.2 to -2.05 from Session 2 to Session 3. For Session 4 the median difference was -2.3.

Table 6a. In-House and Dynastat DRT Scores.
Listening Session 2 - 25 Feb 1976

		IN-HOUSE						DYNASTAT			
		LISTENER									
System	Speaker	1[a]	2[b]	4[a]	5[a]	6[a]	MEAN	MEAN	S.E.	95% C.I.	DIFF
1102	BL	87.5	87.5	86.5	76.0	89.6	84.4*	89.6	1.35	(86.4, 92.8)	-5.2
	CH	86.5	89.6	88.5	84.4	87.5	87.3	89.8	1.19	(87.0, 92.6)	-2.5
	SN	82.3	72.9	82.3	76.0	78.1	78.3*	83.5	1.27	(80.5, 86.5)	-5.2
1103	BL	89.6	82.3	88.5	85.4	87.5	86.7	86.6	1.74	(82.5, 90.7)	+0.1
	CH	91.7	85.4	85.4	87.5	90.6	88.1*	91.7	0.88	(89.6, 93.8)	-3.6
	SN	75.0	74.0	78.1	80.2	75.0	76.5*	79.7	1.04	(77.2, 82.2)	-3.2
1104	BL	85.4	82.3	86.5	85.4	85.4	85.0*	88.3	1.19	(85.5, 91.1)	-3.3
	CH	93.8	85.4	88.5	85.4	87.5	88.1	90.8	1.16	(88.1, 93.5)	-2.7
	SN	83.3	82.3	81.3	80.2	81.3	81.7	82.8	1.55	(79.1, 86.5)	-1.1
1105	BL	81.3	79.2	83.3	79.2	82.3	81.1*	84.8	1.23	(81.9, 87.7)	-3.7
	CH	87.5	83.3	83.3	84.4	88.5	85.4	88.5	1.67	(84.6, 92.4)	-3.1
	SN	82.3	76.0	82.3	80.2	74.0	79.0*	82.2	0.80	(80.3, 84.1)	-3.2

a - First session for this listener.
b - Second session for this listener.
* - Below 95% confidence interval.

Table 6b. In-House and Dynastat DRT Scores.
Listening Session 3 - 4 Mar 1976

System	Speaker	IN-HOUSE LISTENER 3[a]	4[a]	6[a]	7[a]	IN-HOUSE MEAN	DYNASTAT MEAN	S.E.	95% C.I.	DIFF
1106	BL	82.3	86.5	93.8	80.2	85.7	87.8	1.70	(83.3, 91.8)	-2.1
	CH	88.5	90.6	90.6	83.3	88.1*	91.7	0.86	(89.7, 93.7)	-3.4
	SN	74.0	83.3	91.7	77.1	81.5	82.2	1.89	(77.7, 86.7)	-0.7
1108	BL	86.5	86.5	92.7	84.4	88.0	88.2	1.69	(84.2, 92.2)	-0.2
	CH	88.5	95.8	90.6	88.5	90.1*	91.9	0.73	(90.2, 93.6)	-1.8
	SN	76.0	89.6	87.5	82.3	83.9	85.9	1.73	(81.8, 90.0)	-2.0
1110	BL	86.5	89.6	87.5	86.5	87.5*	92.6	1.05	(90.1, 95.1)	-5.1
	CH	85.4	87.5	93.8	83.3	87.5*	93.0	0.70	(91.3, 94.7)	-5.5
	SN	76.0	86.5	82.3	82.3	81.8	83.7	1.57	(79.5, 86.9)	-2.0
1112	BL	86.5	93.8	91.7	86.5	90.1*	92.4	0.67	(90.8, 94.0)	-2.3
	CH	90.6	87.5	92.7	95.8	91.7*	94.8	1.08	(92.2, 97.4)	-3.1
	SN	85.4	88.5	87.5	84.4	86.5	87.0	1.59	(83.2, 90.8)	-0.5

a - Second session for this listener.
* - Below 95% confidence interval.

Table 6c. In-House and Dynastat DRT Scores.
Listening Session 4 - 22 Mar 1976

System	Speaker	IN-HOUSE LISTENER 1[a]	2[b]	4[b]	5[a]	IN-HOUSE MEAN	DYNASTAT MEAN	S.E.	95% C.I.	DIFF
1113	BL	90.6	86.5	89.6	85.4	88.0	90.1	0.90	(88.0, 92.2)	-2.1
	CH	92.7	89.6	89.6	91.7	90.9	92.2	0.65	(90.7, 93.7)	-1.3
	SN	80.2	86.5	89.6	83.3	84.9*	88.0	1.15	(85.3, 90.7)	-3.1
1146	BL	90.6	87.5	88.5	86.5	88.3*	90.8	0.80	(88.9, 92.7)	-2.5
	CH	92.7	92.7	92.7	92.7	92.7	94.8	0.88	(92.7, 96.9)	-2.1
	SN	81.3	84.4	87.5	86.5	84.9*	91.3	1.16	(88.6, 94.0)	-6.4
1150	BL	87.5	85.4	96.9	85.4	88.8	88.4	0.89	(86.3, 90.5)	+0.4
	CH	92.7	90.6	90.6	92.7	91.7*	94.4	0.71	(92.7, 96.1)	-2.7
	SN	84.4	81.3	85.4	86.5	84.4*	88.8	1.14	(86.1, 91.5)	-4.4
1152	BL	88.5	91.7	94.8	89.6	91.2	92.2	0.81	(90.3, 94.1)	-1.0
	CH	92.7	88.5	89.6	88.5	89.8*	92.8	0.80	(90.9, 94.7)	-3.0
	SN	85.4	83.3	85.4	86.5	85.7	87.4	1.05	(84.9, 89.9)	-1.7

a - Second session for this listener.
b - Third session for this listener.
* - Below 95% confidence interval.

3.3.2 REPEATABILITY

During the three listening sessions in October 1976 seven listeners were exposed repeatedly to the same DRT tape. Speaker CH was used for all repetitions. Table 7 contains a summary of the number of repetitions each listener participated in for each of the three sessions. Table 8 contains the mean and standard deviation across repetitions for each listener for each session. For those listeners that participated in two sessions the tendency was for the mean score to rise slightly and the standard deviation to decrease. This is what might be expected from listeners who are relatively inexperienced and are still rising on the "learning curve." A simple linear regression model was fitted to the data for each listener for each session. The independent variable was the repetition number; the dependent variable the DRT score. The intent was to examine the slope of the regression line to determine if a significant linear trend in the listeners' scores existed. Table 9 contains the intercept and slope for each listener as well as a 95 percent confidence interval for the slope of each line. The confidence interval did not contain zero in only two of the twelve cases. This means that the slopes of the remaining ten lines are not significantly different from zero indicating no significant learning trend. Further analysis consisted of computing the DRT mean and standard error across listeners for each repetition during the first and last listening sessions. Table 10 contains these results. Figure 6 is a scatter diagram of this data and contains a linear regression line for each session. The slope of each of these lines is significantly different from zero, however, it can be observed that the rate of increase is smaller for the third session than for the first session. Additionally, the standard errors in Table 10 are reducing and becoming more consistent as the listeners gain experience. Also included in Figure 6 is a 95 percent confidence interval for the mean score for speaker CH based on the mean obtained by Dynastat for the same tape used in our in-house sessions. A reliable estimate for the standard error for this score is not available. However, typical standard errors obtained by Dynastat for speaker CH when the mean is near 93.0 are less than 1.00. The confidence interval shown in Figure 6 was constructed using an estimated standard error of 0.75. All in-house scores for the 20 October 1976 session lie within the confidence interval as well as four of the last five scores on 6 October 1976.

The foregoing results led to the conclusion that a properly selected and trained listening crew used in an in-house program could produce results that are not only repeatable but also comparable to those obtained by Dynastat.

Table 7. Number of DRT Repetitions Listeners Were Exposed to for Speaker CH

Listener	6 Oct 76	12 Oct 76	20 Oct 76
4	9	0	9
8	9	0	9
9	9	9	0
10	9	0	9
11	9	8	0
13	0	0	12
14	0	0	12

Table 8. DRT Means and Standard Deviations Across Repetitions for Each Listener at Each Session

	6 Oct 76		12 Oct 76		20 Oct 76	
Listener	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
4	93.3	2.18	-	-	95.0	1.25
8	95.6	1.86	-	-	96.8	0.63
9	92.0	1.80	92.6	2.05	-	-
10	91.6	3.10	-	-	92.9	1.79
11	87.0*	4.00	92.1	1.66	-	-
13	-	-	-	-	91.7	1.89
14	-	-	-	-	95.3	2.79

*First exposure to the DRT for this listener.

Table 9. Simple Linear Regression Models for Repetition (X) and DRT Score (Y) for Each Listener

Listener	6 OCT 76			12 OCT 76			20 OCT 76		
	Intercept	Slope	95% C.I. for Slope	Intercept	Slope	95% C.I. for Slope	Intercept	Slope	95% C.I. for Slope
4	92.9	0.07	(-0.67, 0.81)	-	-	-	94.6	0.09	(-0.31, 0.49)
8	94.1	0.30	(-0.25, 0.84)	-	-	-	96.1	0.14	(-0.02, 0.30)
9	90.4	0.33	(-0.18, 0.84)	90.2	0.49	(-0.02, 0.99)	-	-	-
10	86.9	0.94*	(0.37, 1.50)	-	-	-	90.9	0.40	(-0.06, 0.86)
11	82.5	0.90	(-0.21, 2.01)	92.8	-0.16	(-0.82, 0.50)	-	-	-
13	-	-	-	-	-	-	91.2	0.07	(-0.29, 0.44)
14	-	-	-	-	-	-	90.7	0.71*	(0.50, 0.93)

*Slope significantly different from zero.

Table 10. DRT Mean and Standard Error Across Listeners for Each Repetition for First and Last Sessions

Repetition	6 Oct 76		20 Oct 76	
	Mean	Std Error	Mean	Std Error
1	88.3	2.01	93.8	0.81
2	90.4	2.47	92.9	1.29
3	91.3	2.12	93.3	1.07
4	94.2	0.78	94.0	1.06
5	92.1	1.50	94.2	1.38
6	90.8	2.04	94.0	0.83
7	92.9	0.77	94.2	1.49
8	93.3	1.38	95.0	1.01
9	93.7	1.47	94.8	1.19

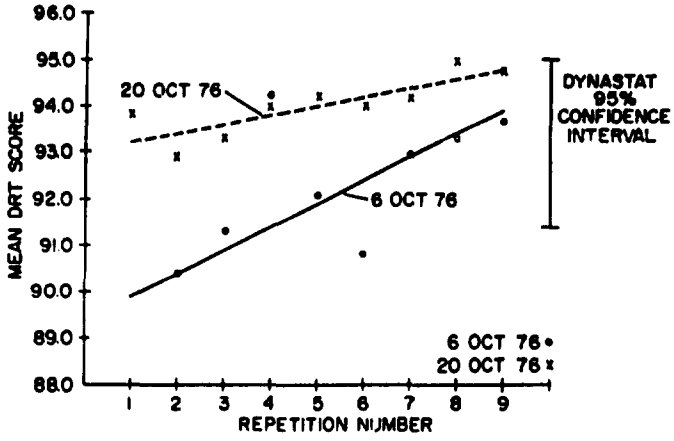


Figure 6. Scatter Diagram and Linear Regression for Mean DRT Score as a Function of Repetition Number

3.4 Conclusions and Recommendations

It was concluded that the DRT scoring software as implemented on the CSP-30 functioned properly, however, the manual entry of the raw data was unsatisfactory. A six speaker, ten listener DRT required approximately two hours to enter the data. The CSP-30 is a single user system, the primary function of which is research and development of voice algorithms. To dedicate the CSP-30 to the time required to enter DRT data is a waste of a valuable resource. In addition, this method of data entry proved to be susceptible to key punch errors. It was recommended that the DRT scoring software be implemented on an existing in-house PDP-11 mini-computer. It was further recommended that an optical mark reader be procured and interfaced to the PDP-11 and that special DRT test forms be designed so that automated data entry could be used in the scoring procedure.

It was further concluded that a listening crew could be trained in-house to perform in a consistent manner and obtain results comparable to those obtained by Dynastat. However, it was considered unsatisfactory to depend on volunteer listeners. Our experience was that it was difficult to obtain volunteers who were willing or able to participate in DRT listening the number of hours and frequency required for them to become consistent, reliable listeners. It was recommended that listeners be hired and that they participate in listening tests a minimum of one-half day each week.

It was further recommended that procedures be developed to recruit, train, and control the listeners and to monitor their performance. In addition, the

development of a method for screening and eliminating those listeners who are unsatisfactory was required.

4. FOLLOW-ON DEVELOPMENT

The decision was made to fully develop the in-house DRT program. The recommendations of Section 3.4 were adopted and implemented. The following Sections describe this development.

4.1 Optical Mark Reader

A search through several issues of the Excess ADP Equipment Bulletin published by the Defense Logistics Agency, Cameron Station, Alexandria, VA 22314 revealed that two (2) Decision Optical Mark Readers (OMR), model OMR 6510 were listed as excess. Further investigation revealed that these readers were located within ESD on Hanscom AFB. Contact with the users was immediately established. A review of the OMR documentation and discussions with the users resulted in the determination that the OMR could easily be interfaced with our PDP-11 and that forms could be designed and procured to satisfy our requirements. A no cost transfer of the OMRs to the Voice Processing Facility was accomplished. It was immediately learned that the interface hardware required was already available in our PDP-11. All that was required was to plug an existing connector into the OMR.

4.1.1 OMR TEST BOOKLETS

DRT test booklets were designed and procured for use with the OMR. Two different test booklets were procured; one for the 100 series word lists (ESD Form 36) and one for the 300 series word lists (ESD Form 37). Each booklet consists of four (4) pages joined together at the left edge by a perforated binding. This is referred to as a four part snapak. This allows the pages to be separated so that they may be fed into the OMR. Figure 7 is a copy of a page from one of the booklets. The only differences between this page and other pages are the words themselves and the position of the black rectangle in the upper right hand corner. This rectangle is used to indicate the booklet page number by it's location. The listeners are required to fill in certain header information on the first page of each booklet before the test begins as indicated in Figure 7. The information is entered by first writing it in the large boxes to the left of each information block. The listeners then blacken in the appropriate rectangles using a No. 2 pencil. During the test listeners strike through the word of their choice as before. After much experimentation it was determined that wide, dark marks are required over the words for reliable OMR reading. A certain amount of practice was required before the listeners

mastered the technique of properly marking the words. The time required for this practice was minimal when compared to the total listener training period. It was determined that the best marker to use is a black tube-type, felt-tip marker, Federal Stock Number 7520-00-973-1059. These markers are available in adequate supply and if stored tip down between listening sessions have a reasonable usable life. Rectangles in the extreme left and right hand margins of each test booklet page are provided to give the listener an opportunity to change his answer by simply marking through the rectangle closest to the word pair to be changed. The test form pages measure 8-1/2 in. × 11 in. after separation. They were designed on a 5446 Decision format sheet (54 columns by 46 rows). The forms were printed using Pantone Purple 185 ink (12 parts warm red, 4 parts rubine red). Complete specifications for the forms are available in the Hanscom Air Force Base, Central Base Administration (DA) office.

4.1.2 SOFTWARE

The software functions required to interface the OMR to the PDP-11 and provide data that can be used by the DRT scoring software consisted of:

a. An OMR driver. This function is required to do the necessary handshaking between the OMR and the PDP-11 interface card (DC-11) and to send and receive necessary status, control, and data words.

b. A page reader. This software module is required to store an image of the test booklet page being read. It consists of filling in a 46 × 54 matrix of zeroes and ones. Each element of the matrix corresponds to a position on the test form page. A zero indicates no mark in that position, a one indicates a mark.

c. A page interpreter. This module interprets the matrix of zeroes and ones constructed by the page reader and extracts the following information:

1. System ID.
2. Listener ID.
3. Word List ID.
4. Speaker ID.
5. Page number.
6. The responses. These are stored in a similar manner as the CSP-30 version.

These functions are drawn together into a program called XXX on the PDP-11 disk file. The output of this program is a disk file containing the data described above. In addition, a program called XFLR is used before actual scoring takes place. This program accesses the data file created by XXX and creates a new file after performing the following:

d. Translates the XXX file into a new file in the format required for the scoring program.

DIAGNOSTIC RHYME TEST

LAST NAME

DAY MONTH YEAR

SYSTEM

WORD LIST

LISTENER

SPEAKER

BOB – GOB	TOOT – COOT
TAUNT – DAUNT	POND – BOND
BOOT – MOOT	BONE – MOAN
CHEAT – SHEET	BILL – VILL
GAB – JAB	GUEST – JEST
TOT – POT	THOUGHT – FOUGHT
BOAST – GHOST	POOP – COOP
NILL – RILL	REAP – NEAP
SAID – ZED	FAST – VAST
DAW – GNAW	DOCK – KNOCK
CHOOSE – SHOES	DOZE – THOSE
KEEP – CHEEP	THING – SING
DANK – BANK	NET – MET
DOT – GOT	TAUGHT – CAUGHT
NOSE – NOSE	RUDE – NUDE
TINT – DINT	PEEN – BEAN
DECK – NECK	BAD – MAD
TONG – THONG	BOX – VOX
COO – CHOO	GO – JOE
REED – WEED	DID – BID
SAG – SHAG	WREN – YEN
ROB – KNOB	NOUGHT – WROUGHT
FOAL – VOLE	SUE – ZOO
DIP – NIP	DEED – NEED
PENCE – FENCE	DAN – THAN
THAW – SAW	COP – CHOP
TOOL – POOL	THOR – FORE
WIELD – YIELD	FIT – HIT
RAT – GNAT	REST – NEST

Figure 7. DRT Test Booklet for Use With the Optical Mark Reader

e. Offers the opportunity to correct word list identification that may have been entered incorrectly.

f. Permits the elimination of selected listeners from the scoring run.

g. Permits the elimination of selected speakers from the scoring run.

The final step in the process is the execution of the scoring program itself. This program is called SCORE and is substantially the same as implemented on the CSP-30. The fundamental differences are:

h. It has been modified to accept data from the disk file rather than the ADDS terminal.

i. The printout of results has been expanded to include a page which consists of a matrix of listener/speaker scores.

Appendix C contains the listings for the above described software and an example DRT printout.

4.2 Program Usage

A step-by-step procedure for using the DRT scoring software follows. It is assumed that the operating system is the RSX-11M and the user is familiar with it. The scoring programs have been written to prompt the use by asking specific questions and waiting for a reply. Also, various error messages are written on the Decwriter when OMR read errors occur. Figure 8 is a copy of the Decwriter output for a DRT scoring run. The example in Figure 8 is for a single listener and a single speaker. Items marked with an asterisk (*) are entered by the user. Figure 9 is the resulting printout of the scoring process for this example. Before starting the procedure the test booklets should be prepared by first arranging them so that the speakers are in the same order for each listener. It is convenient, but not necessary, to arrange the speakers alphabetically and the listeners numerically. Listeners are identified by the last four digits of their social security account number. After arranging the booklets in the desired order the bindings should be removed so that the pages separate:

a. Turn the OMR on and press the feeder clear and reset buttons.

b. Run program XXX and follow instructions printed on the Decwriter. (See Figure 8.)

c. Enter date of test.

d. Enter up to 50 ASCII characters describing the system tested.

e. A disk write option is then selected. If a 1 is entered a disk file will be created. If Ø is entered no file is created. This option is useful for checking the OMR or forms alignment. See paragraph f below. Normal operation is to enter a 1.

f. A line printer output option is then selected. A Ø will cause no line printer output. A 1 will cause a printout to be made of the matrix of zeroes and ones for

each test booklet page. This option is selected when checking forms alignment and OMR operation. Normal procedure is to enter a Ø.

g. Follow instructions for entering the number of listeners and speakers and the system identification number.

h. Follow instructions for entering the word list key and speaker identification. This has been added to eliminate the need for the listeners to blacken in the rectangles on their test booklets corresponding to this information. They should continue to write this information in the large boxes to the left of the rectangles.

i. After entering all word list keys and speakers they will be typed out on the Decwriter for verification. Carefully check their accuracy. If there is an error start over by aborting XXX. This is accomplished by typing in C while holding the CRTL key down followed by ABORTXXX after the MCR prompt. If the word list keys and speakers are correct type in RESUME followed by a carriage return.

j. At this time the pages are manually fed into the OMR. Each page should be placed face down on the glass platen with the header end of the page against the paper gate. After the page is read it is removed from the platen and the next page placed in position. This process is repeated until all pages are read. After the last page is read a blank page (could use reverse side of last page) is placed on the platen and read. This will cause the program to pause.

k. After the pause, if more pages are to be read in enter a Ø. If the scoring run is complete enter a 1. A printout of "bad marks" is made on the Decwriter. These numbers are the number of listener responses not read by the OMR for each listener. This information is used when training new listeners to master the technique of using the markers and to detect OMR read problems. After this printout, XXX stops.

l. Various error conditions can occur while reading pages in. These may be due to the pages being read in the wrong order, a page not properly aligned over the glass platen, or a page read in twice. Error messages are printed on the Decwriter for each of these conditions. Simply correct the problem and type in RESUME.

m. The next step in the process is to execute XFER. Run XFER in the usual way (see Figure 8) and follow instructions.

n. The final step is the actual scoring. Run SCORE and follow instructions. Be sure the line printer is on-line. The result will be a disk file called FORØØ6 DAT containing the scored DRT results. Output this file to the line printer using PIP to obtain hardcopies.

```
*  RUN DF:XXX

   ENTER DATE OF TEST DD-MMM-YY (15-NOV-77) :21 MAR 78
   THIS IS WHAT YOU SAID... 21 MAR 78

   ENTER HEADER INFO...A50
*  DRT SCORING EXAMPLE


   ***COPY TO DISK?..TYPE 0 FOR NO, 1 FOR YES
*  1


   ***COPY TO PRINTER?..TYPE 0 FOR NO; 1 FOR YES
*  0

   ENTER #LISTENERS,#SPEAKERS,#SYSTEM..I2I2I4
   FOR EXAMPLE:08061104 FOLLOWED BY CARRIAGE RETURN
*  01011000
   ENTER KEY AND SPEAKER (E.G.:102BBV) FOR SPEAKER 1
*  304BBV



   CHECK THE KEYS...

   304BBV
   TTO  --  PAUSE ***** READY TO GO *****

*  >RES
   >
    EOF. ENTER 0 TO GO OR 1 TO STOP
*  1

    BAD MARKS,MARKS % ...       1.     232.    0.4
   ****SYSTEM # 1000
   LISTENER 1277         0 ERRORS    %  0.0
   00000 00000 00000 00000 00000 00000 00000 00000 00300 00000 0000
   TTO  --  STOP *** FINISHED ***
   >

*  RUN DF:XFER


   ENTER SYSTEM ID ...I4
*  1000

   21 MAR 78 DRT SCORING EXAMPLE


   HOW MANY LISTENERS TO DELETE?..I2
*  0

   HOW MANY SPEAKERS TO DELETE?..I2
*  0

   ENTER ANY INCORRECT-CORRECTED KEY PAIR (0 IF OK)
*  0
   TTO  --  STOP
   >
```

Figure 8. Sample Decwriter Output During DRT Scoring on PDP-11

```
SYSTEM TESTED: 1000   21 MAR 78 DRT SCORING EXAMPLE

     NUMBER LISTENERS =  1
     NUMBER SPEAKERS  =  1


            *******
FOR LISTENER: 1277 *
            *******

SPKR  SCORE

BV    90.62

MAIN ATTRIBUTE:          PRESENT          ABSENT           TOTAL

                       MEAN    S.E.     MEAN    S.E.     MEAN    S.E.

  VOICING              100.00   0.00    75.00   0.00    87.50   0.00
     FRICTIONAL        100.00   0.00    75.00   0.00    87.50   0.00
     NON-FRICTIONAL    100.00   0.00    75.00   0.00    87.50   0.00

  NASALITY             100.00   0.00   100.00   0.00   100.00   0.00
     GRAVE             100.00   0.00   100.00   0.00   100.00   0.00
     ACUTE             100.00   0.00   100.00   0.00   100.00   0.00

  SUSTENTION           100.00   0.00    87.50   0.00    93.75   0.00
     VOICED            100.00   0.00    75.00   0.00    87.50   0.00
     UNVOICED          100.00   0.00   100.00   0.00   100.00   0.00

  SIBILATION            87.50   0.00   100.00   0.00    93.75   0.00
     VOICED             75.00   0.00   100.00   0.00    87.50   0.00
     UNVOICED          100.00   0.00   100.00   0.00   100.00   0.00

  GRAVENESS             87.50   0.00    75.00   0.00    81.25   0.00
     VOICED             75.00   0.00   100.00   0.00    87.50   0.00
     UNVOICED          100.00   0.00    50.00   0.00    75.00   0.00

  COMPACTNESS          100.00   0.00    75.00   0.00    87.50   0.00
     VOICED            100.00   0.00   100.00   0.00   100.00   0.00
     UNVOICED          100.00   0.00    50.00   0.00    75.00   0.00

  TOTALS                95.83   0.00    85.42   0.00    90.62   0.00

                        ****************
                        * MEAN =  90.62 *
          TOTAL DRT SCORE: *            *
                        * S.E. =  0.00  *
                        ****************
```

Figure 9. Sample Printout Resulting From DRT Scoring on PDP-11

```
SYSTEM TESTED: 1000   21 MAR 78 DRT SCORING EXAMPLE

    NUMBER LISTENERS =  1
    NUMBER SPEAKERS  =  1


          *****
FOR SPEAKER: BV *
          *****

LISTENER      SCORE

1277          90.62

MAIN ATTRIBUTE:          PRESENT              ABSENT               TOTAL
                         MEAN     S.E.        MEAN     S.E.        MEAN     S.E.

  VOICING                100.00   0.00        75.00    0.00        87.50    0.00
    FRICTIONAL           100.00   0.00        75.00    0.00        87.50    0.00
    NON-FRICTIONAL       100.00   0.00        75.00    0.00        87.50    0.00

  NASALITY               100.00   0.00       100.00    0.00       100.00    0.00
    GRAVE                100.00   0.00       100.00    0.00       100.00    0.00
    ACUTE                100.00   0.00       100.00    0.00       100.00    0.00

  SUSTENTION             100.00   0.00        87.50    0.00        93.75    0.00
    VOICED               100.00   0.00        75.00    0.00        87.50    0.00
    UNVOICED             100.00   0.00       100.00    0.00       100.00    0.00

  SIBILATION              87.50   0.00       100.00    0.00        93.75    0.00
    VOICED                75.00   0.00       100.00    0.00        87.50    0.00
    UNVOICED             100.00   0.00       100.00    0.00       100.00    0.00

  GRAVENESS               87.50   0.00        75.00    0.00        81.25    0.00
    VOICED                75.00   0.00       100.00    0.00        87.50    0.00
    UNVOICED             100.00   0.00        50.00    0.00        75.00    0.00

  COMPACTNESS            100.00   0.00        75.00    0.00        87.50    0.00
    VOICED               100.00   0.00       100.00    0.00       100.00    0.00
    UNVOICED             100.00   0.00        50.00    0.00        75.00    0.00

  TOTALS                  95.83   0.00        88.42    0.00        90.62    0.00

                          **********
                          * MEAN = 90.62 *
          TOTAL DRT SCORE: *              *
                          * S.E. =  0.00 *
                          **********
```

Figure 9. Sample Printout Resulting From DRT Scoring on PDP-11 (Cont)

```
SYSTEM TESTED: 1000   21 MAR 78 DRT SCORING EXAMPLE

    NUMBER LISTENERS =  1
    NUMBER SPEAKERS  =  1

COMBINED RESULTS - STANDARD ERRORS ACROSS SPEAKERS AND LISTENERS ******
```

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	75.00	0.00	87.50	0.00
FRICTIONAL	100.00	0.00	75.00	0.00	87.50	0.00
NON-FRICTIONAL	100.00	0.00	75.00	0.00	87.50	0.00
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	100.00	0.00	87.50	0.00	93.75	0.00
VOICED	100.00	0.00	75.00	0.00	87.50	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
SIBILATION	87.50	0.00	100.00	0.00	93.75	0.00
VOICED	75.00	0.00	100.00	0.00	87.50	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
GRAVENESS	87.50	0.00	75.00	0.00	81.25	0.00
VOICED	75.00	0.00	100.00	0.00	87.50	0.00
UNVOICED	100.00	0.00	50.00	0.00	75.00	0.00
COMPACTNESS	100.00	0.00	75.00	0.00	87.50	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	50.00	0.00	75.00	0.00
TOTALS	95.83	0.00	85.42	0.00	90.62	0.00

```
                    **********************
                    * MEAN =    90.62    *
TOTAL DRT SCORE:    *                    *
                    * S.E. =     0.00    *
                    **********************

        BY

MEAN    90.62

S.E.     0.00
```

Figure 9. Sample Printout Resulting From DRT Scoring on PDP-11 (Cont)

```
SYSTEM 1800    21 MAR 78 DRT SCORING EXAMPLE

     NUMBER LISTENERS =  1
     NUMBER SPEAKERS =  1


          SPEAKERS

          BY
LIST.

1277     98.62  98.62   0.00

MEAN     98.62

S.E.      0.00

                                 ******************
                                 * MEAN =  98.62  *
               TOTAL DRT SCORE:  *                *
                                 * S.E. =   0.00  *
                                 ******************
```

Figure 9. Sample Printout Resulting From DRT Scoring on PDP-11 (Cont)

4.3 Listeners

4.3.1 LISTENER BEHAVIORAL CONTROLS

A study was made to determine those controls required to minimize the effects of listener behavior on the DRTs conducted in-house. The study included a search of the applicable literature and a personal interview with Dr. W. D. Voiers, one of the creators of the DRT. A report of this study is included as Appendix D. In addition, a committee was formed to make a determination as to the applicability of AFR 80-33, Use of Volunteers in Aerospace Research to the in-house DRT program. The committee found that the provisions of AFR 80-33 do not apply. A report of these findings is on file at the COMSEC Engineering Office.

4.3.2 RECRUITING

Listeners were recruited by advertising in local newspapers during November 1976. Over one hundred responses were received. Initial screening was accomplished by administering a pure tone audiometric test as was done during the trial period earlier in the year. Those who did not pass the test were not considered for the job. The nature of the work was explained to each application. They were offered $2.50 per hour for one-half day (4-1/2 hours) per week with the understanding that they must successfully complete a training period and that they were subject to removal from the program at any time if their performance was not consistent and reliable. The first eighteen that qualified and were willing entered a training program. Approximately 50 names were retained on a backup list. Since then the 50 names have been exhausted to replace listeners (many did not want the job when called back several weeks later). On one other occasion an advertisement in the newspaper was used again to recruit listeners. Other than that one time, word of mouth through the listening crew has been adequate to recruit replacement listeners.

4.3.3 TRAINING

A training program consisting of four sessions, each four and one-half hours in length, was conducted during December 1976. Of the eighteen listeners who started the program, three quit after the first session, two after the second session, and four were not accepted for the job after the fourth session. The remaining nine stayed on as part of the listening crew. A second training period consisting of three sessions, each four and one-half hours in length, was conducted in January 1977. Five candidates from the backup list participated. Two quit after the second session, the remaining three became part of the listening crew. Of the twelve who were selected four are still part of the listening crew after one year. The remaining eight quit at various times. The first left after 22 weeks. The mean length of time these eight listeners stayed on the crew was 30 weeks. Replacements were recruited and trained as required.

4.3.3.1 Training Material

Training material consisted of repeated applications of two three-speaker DRTs that had been processed by two different narrowband vocoders. The two DRTs were administered 13 times during the December training program. Fifteen single speaker tests were administered the first session and 21 on each of the remaining sessions. After three sessions it was clear which listeners would not be selected, therefore, the January training program consisted of only three sessions. The same training material was used. Fifteen single speaker tests were administered during the first session and 21 the second and third sessions. The speakers were heard repeatedly in the order: BV JE RD BL SN CH. The first three speakers had been processed by a tenth order Linear Predictive Vocoder (LPC)[6] at a 3.6 kbps data rate, the last three by TRIVOC (4-14)[7] at 2.4 kbps. These DRTs had been previously evaluated by Dynastat. Table 11 contains the mean DRT scores and standard deviations obtained by Dynastat for each of the systems used during the training.

Table 11. DRT Scores Obtained by Dynastat for the Test Material Used During In-House Training Program in December 1976 and January 1977

System	Speaker	Mean	Standard Deviation*
1104 (LPC)	BV	86.1	2.80
	JE	84.6	1.53
	RD	89.7	1.32
2003 (TRIVOC)	BL	87.2	1.61
	SN	86.8	2.88
	CH	95.2	1.64

*Standard deviations were computed from furnished standard errors using the formula

$$\text{Standard Error} = \frac{\text{Standard Deviation}}{\sqrt{N-1}}$$

where

N = number of listeners.

6. Wiggins, R. H. (1978) Narrowband Digital Voice Processing (CSP-30 LPC Software Documentation), Volume I, ESD-TR-78-282.

7. Roberts, J. E., Smith, C. P., and Wiggins, R. H. (1975) Triple-function voice coder (TRIVOC), J. Acous. Soc. Am. 57 Suppl. 1:535.

4.3.3.2 Training Results

Time and space does not permit complete exposure of the results for every listener who entered the training program in this report. Three listeners were randomly selected to illustrate the kinds of results obtained during the training. Listener 3299 participated in the December 1976 training period and was not selected to continue in the program. Table 12a contains a summary of all DRT scores achieved by this listener. Listener 5699 also participated in the December training. This listener's scores are contained in Table 12b. Listener 5699 was selected to continue in the program and remained with the listening crew for 25 weeks. Listener 9557 was a member of the January training group. Scores for this listener are contained in Table 12c. Listener 9557 was selected and continues to be a member of the crew after 14 months. Tables 12a, b, and c also contain entries for the last two training sessions which are the number of standard deviations the listeners' DRT scores are from the Dynastat scores. These entries are based on the data in Table 11. Table 13a is a summary of the number of times each listeners' score was two or more standard deviations below Dynastat. Table 13b is a summary of the number of times each listeners' score was three or more standard deviations below Dynastat. Over half the time listener 3299 scored more than three standard deviations below Dynastat. In addition, this listener did not perform consistently as can be observed in Table 12a. For these reasons listener 3299 was not retained. Listener 5699 was above three standard deviations below Dynastat over 80 percent of the time. Listener 9557, after only three training sessions, scored above three standard deviations below Dynastat over 70 percent of the time. Both of these listeners scored above Dynastat on several occasions. In addition, except for an occasional "outlier", both of these listeners were consistent. These two listeners were selected to continue. These results are representative of all who participated in both the December and January training periods. Those who were eliminated from the program performed as did listener 3299. Those who were selected performed in a similar manner as listeners 5699 and 9557.

Table 12a. Training History for Listener 3299. Top number is DRT score. Botton number (for last two sessions only) is number of standard deviations listener score is from Dynastat score

	REPITITION NUMBER												
Speaker	1	2	3	4	5	6	7	8	9	10	11	12	13
BV	61.5	71.9	74.0	74.0	71.9	70.8	78.1 -2.36	76.0 -3.61	78.1 -2.86	68.8 -6.18	77.1 -3.21	77.1 -3.21	80.2 -2.11
JE	68.8	74.0	79.2	70.8	76.0	78.1	78.1 -4.25	82.3 -1.50	79.2 -3.53	85.4 +0.52	83.3 -0.85	76.0 -5.62	81.3 -2.16
RD	80.2	78.1	78.1	77.1	82.3	79.2	83.3 -4.85	86.5 -2.42	84.4 -4.02	85.4 -3.26	83.3 -4.85	87.5 -1.67	88.5 -0.91
BL	69.8	69.8	71.9	80.2	83.3	78.1	74.0 -8.20	75.0 -7.58	83.3 -2.42	77.1 -6.27	85.4 -1.12	79.2 -4.97	83.3 -2.42
SN	68.8	76.0	69.8	81.3	76.0	74.0	81.3 -1.91	78.1 -3.02	80.2 -2.29	82.3 -1.56	82.3 -1.56	77.1 -3.36	79.2 -2.64
CH	90.6	85.4	83.3	89.6	87.5	84.4	88.5 -4.09	87.5 -4.70	89.6 -3.41	93.8 -0.85	86.5 -5.30	88.5 -4.09	86.5 -5.30
	2 December		9 December				16 December			20 December			

Table 12b. Training History for Listener 5699. Top number is DRT score. Bottom number (for last two sessions only) is number of standard deviations listener score is from Dynastat score

	REPITITION NUMBER												
Speaker	1	2	3	4	5	6	7	8	9	10	11	12	13
BV	71.9	83.3	81.3	82.3	82.3	82.3	81.3 -1.71	82.3 -1.36	85.4 -0.25	82.3 -1.36	80.2 -2.11	87.5 +0.50	85.4 -0.25
JE	76.0	78.1	79.2	78.1	81.3	78.1	80.2 -2.88	83.3 -0.85	74.0 -6.93	81.3 -2.16	77.1 -4.90	79.2 -3.53	79.2 -3.53
RD	89.6	86.5	90.6	91.7	88.5	87.5	87.5 -1.67	90.6 +0.68	92.7 +2.27	88.5 -0.91	90.6 +0.68	92.7 +2.27	90.6 +0.68
BL	84.4	86.5	86.5	86.5	85.4	82.3	84.4 -1.74	85.4 -1.12	83.3 -2.42	87.5 +0.19	84.4 -1.74	86.5 -0.43	84.4 -1.74
SN	74.0	77.1	75.0	81.3	81.3	76.0	81.3 -1.91	83.3 -1.22	81.3 -1.91	79.2 -2.64	81.3 -1.91	77.1 -3.37	84.4 -0.83
CH	88.5	95.8	91.7	90.6	94.8	87.5	93.8 -0.85	88.5 -4.09	88.5 -4.09	90.6 -2.80	90.6 -2.80	92.7 -1.52	94.8 -0.24
	2 December		9 December				16 December			20 December			

Table 12c. Training History for Listener 9557. Top number is DRT score. Bottom number (for last two sessions only) is number of standard deviations listener score is from Dynastat score

	REPITITION NUMBER									
Speaker	1	2	3	4	5	6	7	8	9	10
BV	67.7	83.3	78.1	83.3 +1.00	88.5 +0.86	87.5 +0.50	84.4 -0.61	83.3 -1.00	80.2 -2.11	82.3 -1.36
JE	71.9	83.3	83.3	77.1 -4.90	82.3 -1.50	81.3 -2.16	83.3 -0.85	82.3 -1.50	79.2 -3.53	82.3 -1.50
RD	78.1	90.6	86.5	91.7 +1.52	89.6 -0.08	94.8 +3.86	92.7 +2.27	91.7 +1.52	88.5 -0.91	93.8 +3.11
BL	72.9	82.3	77.1 -6.27	81.3 -3.66	85.4 -1.12	81.3 -3.66	82.3 -3.04	79.2 -4.97	83.3 -2.42	
SN	81.3	83.3	71.9 -5.18	79.2 -2.64	81.3 -1.91	83.3 -1.22	81.3 -1.91	78.1 -3.02	83.3 -1.22	
CH	87.5	93.8	89.6 -3.41	91.7 -2.13	91.7 -2.13	91.7 -2.13	81.3 -8.48	89.6 -3.41	91.7 -2.13	
	6 January		13 January				20 January			

Table 13a. Number of Times Listeners' Score Was Two or More Standard Deviations Below Dynastat Score (last two sessions only)

	Listener		
Speaker	3299	5699	9557
BV	7	1	1
JE	4	6	3
RD	5	0	0
BL	6	1	6
SN	4	2	3
CH	6	4	7
Total	32 (76%)	14 (33%)	20 (48%)

Table 13b. Number of Times Listeners' Score Was Three or More Standard Deviations Below Dynastat Score (last two sessions only)

	Listener		
Speaker	3299	5699	9557
BV	4	0	0
JE	3	4	2
RD	4	0	0
BL	4	0	5
SN	2	1	2
CH	6	2	3
Total	23 (55%)	7 (17%)	12 (29%)

5. PERFORMANCE OF IN-HOUSE DRTs

As discussed earlier in this report, it is essential that DRT scores be repeatable for a successful in-house program. In addition, it is desirable that in-house DRT scores be comparable to Dynastat scores. Results obtained over the first 12 months of the in-house program indicate that both repeatability and comparability have been achieved.

5.1 Listener Elimination

Normally a DRT is administered to 10 or 12 listeners. However, it is likely that one or two of them are trainees and one or two may not be performing up to their normal standard. Therefore a screening process is used to eliminate listeners from a given scoring run. The number of listeners is reduced to eight for each scoring run. This is the number that Dynastat uses. The elimination procedure used has been developed to improve the consistency of the listeners as a group by eliminating outliers. Let L = number of listeners and s = number of speakers for a particular DRT. Suppose X_{ij} is the ith listeners' DRT score for speaker j where i = 1,..., L and j = 1,..., S. We compute the mean DRT score for each speaker j.

$$\bar{X}\cdot j = \frac{1}{L} \sum_{i=1}^{L} X_{ij}, \quad j = 1, \ldots, s .$$

We then form a matrix whose elements D_{ij} are the differences between the ith listener's score for speaker j and the mean for speaker j. Thus,

$$D_{ij} = X_{ij} - \bar{X}\cdot j, \quad i = 1, \ldots, L; \; j = 1, \ldots, s .$$

Those listeners who are performing at or near the mean for all speakers will have differences that are near zero. Those that perform exceptionally low or high for one or more speakers might be considered outliers. A measure based on the magnitude of these differences is used to eliminate the listener who is an outlier. The measure is

$$VAR_i = \frac{1}{S} \sum_{j=1}^{s} D_{ij}^2, \quad i = 1, \ldots, L .$$

The listener having the largest VAR_i is eliminated from the scoring run. L is then reduced by one and the process is repeated by computing new speaker means and differences. Again VAR_i is computed for each listener and the next listener is eliminated. This procedure is repeated until only eight listeners remain. This

process allows for the possibility of very high scoring listeners to be eliminated. However, it has been our experience that only rarely is a high scoring listener eliminated.

5.2 Repeatability and Comparability

Every listening session is started by administering the same three-speaker DRT. We refer to this DRT as the probe. The probe was also used during the training periods in December 1976 and January 1977. It consists of the first three speakers from Table 11. The scores obtained by each listener for the probe is closely tracked in order to monitor the listeners' consistency. The mean score for the probe each week provides us a measure of repeatability as well as a comparison with Dynastat scores. Additionally, from time to time a particular DRT is administered to the listening crew a second or third time in order to measure repeatability. Figure 10 is a scatter diagram of mean DRT scores for the probe for 40 repetitions. Each point represents one administration of the test. The first test was given on 14 January 1977 and the last on 22 December 1977. Each mean is based on only eight listener scores. Elimination of listeners was accomplished as described in Section 5.1. Also included in the figure is a confidence interval for the mean based on a Dynastat score of 86.8 and standard error of 0.75 for these speakers. A rapid learning trend during the first four sessions is apparent in the figure. After that time the scores are rather consistent except for a drop after the 22nd repetition. This was a time when several new listeners were added to replace departing members of the crew. The low scores for repetition numbers 23, 29, and 35 can be explained by noting that a full listening crew was not available on those dates and trainees' scores are included in the mean. 95 percent confidence intervals for the mean DRT score in the range 88 to 90 are typically two to three points wide. Most of the scores reflected in Figure 10 are well within a three-point band. This indicates that the in-house listening crew performs consistently over time. In-house DRT scores are shown to be comparable with scores obtained by Dynastat in Table 14. Table 14 contains mean DRT scores and standard errors for those systems that have been tested at least three times using either in-house or Dynastat resources. A one-way classification analysis of variance[4] was performed on the scores for each system. No significant differences were found. This indicates that in-house and Dynastat DRT scores for the same system are essentially the same. Thus, direct statistical comparisons can be made using a mix of in-house and Dynastat DRT results.

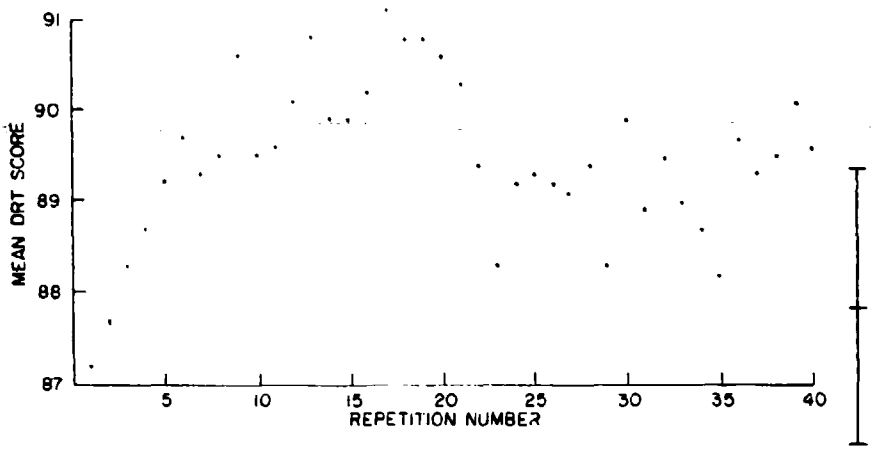


Figure 10. Mean DRT Scores for Probe After Eliminating Outlier Listeners

Table 14. In-House and Dynastat DRT Scores

SYSTEM ID	IN-HOUSE (MEAN/STANDARD ERROR) REPETITION			DYNASTAT (MEAN/STANDARD ERROR) REPETITION	
	1	2	3	1	2
2001	91.9/0.46			90.6/0.62	90.4/0.65
2017	87.5/0.46			85.0/0.93	85.9/0.51
2025	91.3/0.44	91.5/0.43		89.6/0.74	
2043	92.2/0.48	92.6/0.41		90.9/0.28	
2047	87.7/0.63	88.4/0.58		87.1/0.56	
2048	79.8/0.59	81.4/0.56	78.9/0.74	81.5/0.85	
2049	70.5/0.90	71.9/0.85		72.3/0.95	
2050	90.6/0.40	91.3/0.35		91.7/0.37	
2051	85.2/0.63	86.7/0.54		86.0/0.38	
2052	76.7/0.76	77.5/0.71	75.9/0.90	77.2/0.70	
2054	68.8/0.86	68.3/0.80		69.1/1.29	
2058	81.2/1.61	81.5/1.43		83.5/0.80	
2060	81.0/1.17	79.3/1.49		82.6/0.65	
2069	88.6/0.52	89.7/0.55	89.7/0.42	88.7/0.30	
2070	84.7/0.72	86.2/0.73		87.6/0.57	
2071	69.2/1.12	69.3/1.21		71.4/0.96	
2072	68.5/1.81	70.2/1.74		72.8/0.59	
2073	84.7/0.60	85.3/0.63		84.5/0.73	

6. COST

The weekly costs to conduct in-house DRTs are summarized below:

Listener salaries 12 listeners, 4-1/2 hours at $3.00 per hour		$162.00
Test booklets 252 booklets at $.11 each		27.72
Test Administrator Salary 5 hours at approximately $8.00 per hour		40.00
Scoring Cost:		
Scorer salary (6 hours at $3.00 per hour)	$18.00	
Computer	No Charge	18.00
Total cost for three six-speaker DRTs:		$247.72
Cost for one six-speaker DRT:		
In-house	$82.85	

The above in-house cost does not include development and implementation of the in-house capability. These additional costs, if apportioned over a 3-year period, would add less than $50.00 to the cost of a single six-speaker DRT. Overhead costs have not been included in the above figures. Allowing for as much as 100 percent for overhead results in a final in-house cost for a six-speaker DRT that is significantly lower than that charged by a contractor. Sufficient demand exists to utilize the entire in-house capability of 150 six-speaker DRTs each year, thus realizing a large cost savings.

7. CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the in-house DRT capability is a cost-effective means of providing a needed measure of voice communications intelligibility. It provides reliable data that is based on a widely accepted measure of intelligibility that is fast becoming a DoD Standard. It has been shown that the in-house testing provides results that are equivalent to those provided by contractor resources at a large cost savings. The in-house capability provides the additional advantage of rapid turnaround time, thus allowing decisions to be made in a timely fashion. The reduced unit cost of in-house DRTs allows us to perform the large number of DRTs required for our on-going algorithm development. Contractor costs for the number of DRTs required would be prohibitive. In addition to substantial cost savings and speedy turn-around, it is essential for the Government to have an in-house mechanism for validating results that might otherwise only be available from one, or very few other sources. This is particularly important in view of the decisions based on these results. It is recommended that the in-house capability be maintained.

It is a valuable resource that has widespread application throughout the Department of Defense. This capability could be expanded to serve the needs of other agencies requiring intelligibility testing and thus realize its maximum potential benefit. It is further recommended that continued use of contractor resources be made for conducting DRTs so that independent, unbiased results can be obtained at key points in our investigations. This will further serve to verify in-house results and provide a periodic comparison between in-house and contractor DRT scores.

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Appendix A

Diagnostic Rhyme Test
Word Lists

DIAGNOSTIC RHYME TEST

WORD LIST
1R2A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	TEST	PAN	BOB	TOOT	PEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
ROOT	MOAN	NEWS	DOTE	MOOT	BONE	DUES	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
TOT	FOUGHT	MAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	POOR	SHOW	YOU	GHOST	COOP	SO	RUE
LIP	LEAP	RID	REEK	RIP	REAP	LID	LEAK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
DANK	NET	PAD	PENT	BANK	MET	THAD	TENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	FOP	WALL
LOAD	RUDE	ROW	LOOT	ROAD	LEWD	LOW	ROOT
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHOO	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
ROT	RAW	LOCK	LONG	LOT	LAW	ROCK	WRONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
LAP	LEST	RAMP	REND	RAP	REST	LAMP	LEND

DIAGNOSTIC RHYME TEST

WORD LIST
1988

PAGE 1

BOB	COOT
DAUNT	POND
BOOT	MOAN
CHEAT	VILL
JAB	GUEST
TOT	THOUGHT
GHOST	COOP
LIP	LEAP
SAID	FAST
DAM	KNOCK
CHOOSE	DOZE
KEEP	THING
BANK	MET
DOT	CAUGHT
LOAD	LEND
DINT	PEEN
DECK	MAD
THONG	VOX
CHOO	JOE
WEED	DID
SAG	WREN
ROT	LAW
FOAL	ZOO
DIP	WFED
FENCE	DAN
THAW	COP
POOL	THOR
WIELD	PIT
RAP	LEST

PAGE 2

PEST	PAN
FAULT	JOCK
NEWS	DOTE
VEE	TICK
THANK	CHAIR
WAD	BONG
BO	RUE
RID	REEK
DENSE	GAPP
MOSS	BOMB
FOO	THOUGH
ZEE	JILT
THAD	TENT
MOP	WALL
RON	ROOT
CHIN	VEAL
MEND	DAB
CHAW	BON
GOOSE	THOLE
TEAK	PIN
GAT	KEG
LOCK	WRONG
GOAT	TUNE
MIT	BEET
DEN	SHAD
JAWS	JOT
NOON	BOWL
KEY	GILL
LAMP	REND

PAGE 3

BOB	TOOT
TAUNT	BOND
MOOT	BONE
SHEET	BILL
GAB	JEST
POT	FOUGHT
BOAST	POOP
RIP	REAP
ZED	VAST
GNAW	DOCK
SHOES	THOSE
CHEEP	SING
DANK	NET
GOT	TAUGHT
ROAD	RUDE
TINT	BEAN
NECK	BAD
TONG	BOX
COO	GO
REED	AID
SHAG	YEN
LOT	RAW
VOLE	SUE
WIP	DEED
PENCE	THAN
RAW	CHOP
TOOL	FORE
YIELD	HIT
LAP	REST

PAGE 4

TEST	PAN
VAULT	CHOCK
DUPS	NOTE
BEE	THICK
SANK	CAKE
ROD	DONG
SHOW	YOU
LID	LEEK
TENSE	CALF
BOSS	MOM
POOH	DOUGH
THEE	GILT
PAD	PENT
POP	YAWL
LOW	LOOT
GIN	FEEL
BEND	NAB
SHAW	VON
JUICE	SOLE
PEEK	THIN
BAT	PEG
ROCK	LONG
COAT	DUNE
BIT	MEET
THEN	CHAD
GAUZE	GOT
MOON	DOLE
TEA	DILL
RAMP	LEND

DIAGNOSTIC RHYME TEST

WORD LIST
1A3A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	GOB	COOT	TEST	PAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
ROOT	MOAN	NEWS	DOTE	MOOT	BONE	DUES	NOTE
CHEAT	VILL	VEE	TICK	SWEET	BILL	BEE	THICK
GAB	GUEST	SANK	CHAIR	JAB	JEST	THANK	CARE
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
LIP	REAP	RID	LEEK	RIP	LEAP	LID	REEK
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
DANK	MET	FAD	TENT	BANK	NET	THAD	PENT
DOT	CAUGHT	MOP	WALL	GOT	TAUGHT	POP	YAWL
LOAD	RUDE	ROW	LOOT	ROAD	LEND	LOW	ROOT
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
COO	JOE	JUICE	THOLE	CHOO	GO	GOOSE	SOLE
WEED	BID	TEAK	THIN	WEED	DID	PEEK	FIN
SAG	WREN	GAT	KEG	SHAG	YEN	BAT	PEG
LOT	RAW	ROCK	LONG	POT	LAW	LOCK	WRONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
YIELD	HIT	TEA	DILL	WIELD	FIT	KEY	GILL
LAP	REST	RAMP	LEND	RAP	LEST	LAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
1938

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
ROOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	VILL	VEF	TICK	SHEET	BILL	BEE	THICK
GAB	GUEST	SANK	CHAIR	JAB	JEST	THANK	CARE
POT	THOUGHT	ROD	BONG	TOT	FOUGHT	WAD	DONG
ROAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
RIP	LEAP	LID	REEK	LIP	REAP	RID	LEEK
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	HOM
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	MET	PAD	TENT	BANK	NET	THAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	HOP	YAWL
ROAD	LEND	LON	ROOT	LOAD	RUDE	ROW	LOOT
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
COO	JOE	JUICE	THOLE	CHOO	GO	GOOSE	SOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
LOT	RAW	ROCK	LONG	ROT	LAW	LOCK	WRONG
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
DIP	NEED	MIT	BEET	NIP	SEED	BIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
YIELD	HIT	TEA	DILL	WIELD	FIT	KEY	GILL
LAP	LEST	RAMP	REND	RAP	REST	LAMP	LEND

DIAGNOSTIC RHYME TEST

WORD LIST
194A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	YEST	PAN	ROB	TOOT	PEST	FAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MOOT	BONE	DIES	NOTE	BOOT	MOAN	NEWS	DOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
SAB	JEST	BANK	CARE	JAB	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
LIP	REAP	RID	LEEK	RIP	LEAP	LID	REEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	THOSE	PHON	DOUGH	CHOOSE	DOZE	POO	THOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
BANK	MET	THAD	TENT	DANK	NET	PAD	PENT
BOT	TAUGHT	POP	YAWL	DOT	CAUGHT	MOP	WALL
LOAD	RUDE	ROW	LOOT	ROAD	LEWD	LOW	ROOT
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	GO	JUICE	SOLF	CHOO	JOE	GOOSE	THOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	WREN	BAT	KEG	RAG	YEN	GAT	PEG
LOT	RAW	POCK	LONG	ROT	LAW	LOCK	WRONG
FOAL	SUE	LOAT	DUNE	VOLE	ZOO	COAT	TUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
YIELD	MIT	TEA	DILL	WIELD	FIT	KEY	GILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
1948

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
ROB	TOOT	PEST	FAN	ROB	COOT	TEST	PAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
GAB	GUEST	SANK	CHAIR	JAB	JEST	THANK	CARE
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
GHOST	POOP	SO	YOU	ROAST	COOP	SHOW	RUE
LIP	REAP	RID	LEEK	RIP	LEAP	LID	REEK
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
CHOOSE	THOSE	FOO	DOUGH	SHOES	OOZE	POOH	THOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
GOT	CAUGHT	POP	WALL	DOT	TAUGHT	HOP	YAWL
ROAD	RUDE	LOW	LOOT	LOAD	LEWD	ROW	ROOT
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
CHOO	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SAG	YEN	GAT	PEG	SNAG	WREN	BAT	KEG
ROT	LAW	LOCK	WRONG	LOT	RAW	ROCK	LONG
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
NIP	NEED	BIT	BERT	DIP	DEED	MIT	MEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
LAP	LEST	RAMP	REND	RAP	REST	LAMP	LEND

DIAGNOSTIC RHYME TEST

WORD LIST
1-5A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	BOB	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	JEST	THANK	CARE	GAB	GUEST	BANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
BOAST	POOP	SHON	YOU	GHOST	COOP	SO	RUE
RIP	REAP	LID	LEEK	LIP	LEAP	RID	REEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
GOT	TAUGHT	POP	YAWL	DOT	CAUGHT	MOP	WALL
ROAD	RUDE	LOW	LOOT	LOAD	LEWD	RON	ROOT
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
COO	GO	JUICE	SOLE	CHOO	JOE	GOOSE	THOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
LOT	LAW	ROCK	WRONG	ROT	RAW	LOCK	LONG
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
NIP	NEED	BIT	BEET	DIP	DEED	HIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
1988

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	TOOT	TEST	PAN	BOB	COOT	PEST	PAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
MOOT	MOAN	DUES	DOTE	BOOT	BONE	NEWS	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	POOP	SHUN	YOU	GHOST	COOP	SO	RUE
LIP	LEAP	RID	REEK	RIP	REAP	LID	LEEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
DANK	MET	FAD	TENT	RANK	NET	THAD	PENT
DOT	CAUGHT	MOP	WALL	GOT	TAUGHT	FOP	YAWL
ROAD	RUDE	LOW	LOOT	LOAD	LEWD	ROW	ROOT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	GO	JUICE	SOLE	CHOO	JOE	GOOSE	THOLE
WEED	DID	TEAK	PIN	REED	BID	PEEK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
ROT	LAW	LOCK	WRONG	LOT	RAW	ROCK	LONG
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
PENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	HIT	KEY	DILL	YIELD	PIT	TEA	GILL
LAP	LEST	RAMP	REND	RAP	REST	LAMP	LEND

DIAGNOSTIC RHYME TEST

WORD LIST
1966A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	ROB	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	BILL	VEE	THICK	SHEET	[illegible]	BEE	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
POT	THOUGHT	ROD	BONG	TOT	FOUGHT	NAD	DONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
LIP	[illegible]	RID	LEEK	RIP	LEAP	LID	REEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	DOCK	ROSS	MOM	DAW	KNOCK	MOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
BANK	MET	THAD	TENT	DANK	NET	FAD	PENT
DOT	CAUGHT	HOP	WALL	GOT	TAUGHT	FOP	YAWL
LOAD	LEWD	RON	ROOT	ROAD	RUDE	LOW	LOOT
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	GO	JUICE	SOLE	CHOO	JOE	GOOSE	THOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SAG	WREN	GAT	KEG	SHAG	YEN	BAT	PEG
LOT	LAW	ROCK	WRONG	ROT	RAW	LOCK	LONG
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
PENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
LAP	LEST	RAMP	REND	RAP	REST	LAMP	LEND

DIAGNOSTIC RHYME TEST

WORD LIST
1968

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	GOB	COOT	TEST	PAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
POT	THOUGHT	ROD	SONG	TOT	FOUGHT	MAD	DONE
GHOST	COOP	SO	RUE	BOAST	POOP	SHOW	YOU
RIP	REAP	LID	LEEK	LIP	LEAP	RID	REEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAM	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	NET	PAD	PENT	BANK	MET	THAD	TENT
DOT	CAUGHT	MOP	WALL	GOT	TAUGHT	POP	YAWL
ROAD	RUDE	LOW	LOOT	LOAD	LEWD	ROW	ROOT
TINT	BEAN	GIN	PEEL	DINT	PEEN	CHIN	VEAL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
CHOO	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	PIN
SHAG	WREN	BAT	KEG	SAG	YEN	GAT	PEG
LOT	RAW	ROCK	LONG	ROT	LAW	LOCK	WRONG
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAP	LEST	LAMP	BEND	LAP	REST	RAMP	LEND

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GOB	COOT	TEST	PAN	BOB	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	BONE	DUES	NOTE	BOOT	MOAN	NEWS	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
TOT	FOUGHT	MAD	DONG	POT	THOUGHT	ROD	BONG
GHOST	COOP	SO	RUE	ROAST	POOP	SHOW	YOU
LIP	REAP	RID	LEEK	RIP	LEAP	LID	REEK
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
BANK	MET	THAD	TENT	DANK	NET	FAD	PENT
DOT	TAUGHT	MOP	YAWL	GOT	CAUGHT	POP	WALL
ROAD	RUDE	LOW	LOOT	LOAD	LEND	ROW	ROOT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHOO	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
REED	DID	PEEK	PIN	WEED	BID	TEAK	THIN
SHAG	WREN	BAT	KEG	SAG	YEN	GAT	PEG
ROT	LAW	LOCK	WRONG	LOT	RAW	ROCK	LONG
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
PENCE	DAN	THEN	SHAD	PENCE	THAN	DEN	CHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
WIELD	FIT	KEY	GILL	YIELD	MIT	TEA	DILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
1978

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
ROB	COOT	PEST	PAN	ROB	TOOT	TEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
ROOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROD	SONG
GHOST	POOP	SO	YOU	BOAST	COOP	SHOW	RUE
RIP	REAP	LID	LEEK	LIP	LEAP	RID	REEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
BANK	NET	THAD	PENT	DANK	MET	FAD	TENT
POT	CAUGHT	MOP	WALL	GOT	TAUGHT	FOP	YAWL
LOAD	RUDE	ROW	LOOT	ROAD	LEND	LOW	ROOT
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
COO	GO	JUICE	SOLE	CHOO	JOE	GOOSE	THOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SAG	WREN	GAT	KEG	SHAG	YEN	BAT	PEG
LOT	RAW	ROCK	LONG	ROT	LAW	LOCK	WRONG
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	MIT	KEY	DILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

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PAGE 1

BOB	TOOT
DAUNT	POND
MOOT	BONE
SHEET	VILL
GAB	JEST
TOT	FOUGHT
BOAST	POOP
LIP	REAP
SAID	FAST
GNAW	DOCK
SHOES	DOZE
CHEEP	SING
BANK	NET
DOT	TAUGHT
LOAD	LEND
TINT	PEEN
NECK	MAD
THONG	VOX
COO	GO
REED	BID
SHAG	WREN
LOT	LAW
FOAL	ZOO
DIP	NEED
FENCE	THAN
THAW	COP
TOOL	THOR
WIELD	FIT
LAP	REST

PAGE 2

PEST	PAN
FAULT	JOCK
DUES	NOTE
BEE	TICK
BANK	CARE
MAD	DONG
SHOW	YOU
RID	LEEK
DENSE	GAFF
BOSS	MOM
POOH	THOUGH
THEE	GILT
THAD	PENT
MOP	YAWL
ROW	ROOT
GIN	VEAL
BEND	DAB
CHAW	EON
JUICE	SOLE
PEEK	THIN
BAT	KEG
ROCK	WRONG
GOAT	TUNE
MIT	BEET
DEN	CHAD
JAWS	JOT
MOON	BOWL
KEY	GILL
RAMP	LEND

PAGE 3

GOB	COOT
TAUNT	BOND
BOOT	MOAN
CHEAT	BILL
JAB	GUEST
POT	THOUGHT
GHOST	COOP
RIP	LEAP
ZED	VAST
DAW	KNOCK
CHOOSE	THOSE
KEEP	THING
DANK	MET
GOT	CAUGHT
ROAD	RUDE
DINT	BEAN
DECK	BAD
TONG	BOX
CHOO	JOE
WEED	DID
BAG	YEN
ROT	RAW
VOLE	SUE
NIP	DEED
PENCE	DAN
SAW	CHOP
POOL	FORE
YIELD	MIT
RAP	LEST

PAGE 4

TEST	PAN
VAULT	CHOCK
NEWS	DOTE
VEE	THICK
THANK	CHAIR
ROD	BONG
SO	RUE
LID	REEK
TENSE	CALF
MOSS	BOMB
FOO	DOUGH
ZEE	JILT
PAD	TENT
POP	WALL
LOW	LOOT
CHIN	FEEL
MEND	NAB
SHAW	YON
GOOSE	THOLE
TEAK	PIN
GAT	PEG
LOCK	LONG
COAT	DUNE
BIT	MEET
THEN	SHAD
GAUZE	GOT
NOON	DOLE
TEA	DILL
LAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	BOB	TOOT	PEST	FAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	SILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
GHOST	COOP	BO	RUE	BOAST	POOP	SHOW	YOU
RIP	LEAP	LID	REEK	LIP	REAP	RIO	LEEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	POO	DOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
DANK	NET	FAD	PENT	BANK	MET	THAD	TENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	POP	WALL
LOAD	LEWD	ROW	ROOT	ROAD	RUDE	LOW	LOOT
DINT	BEAN	CHIN	PEEL	TINT	PEEN	GIN	VEAL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
COO	GO	JUICE	SOLE	CHOO	JOE	GOOSE	THOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SAG	WREN	GAT	KEG	SWAG	YEN	BAT	PEG
ROT	RAW	LOCK	LONG	LOT	LAW	ROCK	WRONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
PENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
TOOL	THOR	MOON	BOWL	POOL	POKE	NOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	PAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
MOOT	BONE	DUES	NOTE	BOOT	MOAN	NEWS	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
LIP	LEAP	RID	REEK	RIP	REAP	LID	LEEK
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	MET	FAD	TENT	BANK	NET	THAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	MOP	YAWL
LOAD	LEND	ROW	ROOT	ROAD	RUDE	LOW	LOOT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
COO	GO	JUICE	SOLE	CHOO	JOE	GOOSE	THOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SHAG	YEN	RAT	PEG	SAG	WREN	GAT	KEG
ROT	RAW	LOCK	LONG	LOT	LAW	ROCK	WRONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAN	CHOP	JAWS	GOT	SAN	COP	GAUZE	JOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
WIELD	MIT	KEY	DILL	YIELD	FIT	TEA	GILL
LAP	REST	RAMP	LEND	RAP	LEST	LAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	TOOT	TEST	FAN	BOB	COOT	PEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
ROOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	VILL	VEE	TICK	SWEET	SILL	BEE	THICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
GHOST	COOP	SO	RUE	ROAST	POOP	SHOW	YOU
LIP	LEAP	RID	REEK	RIP	REAP	LID	LEEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	THOSE	FOD	DOUGH	SHOES	DOZE	POOH	THOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
DANK	NET	FAD	PENT	RANK	MET	THAD	TENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	FOP	WALL
LOAD	LEWD	ROW	ROOT	ROAD	RUDE	LOW	LOOT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	JOE	JUICE	THOLE	CHOO	GO	GOOSE	SOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
ROT	LAW	LOCK	WRONG	LOT	RAW	ROCK	LONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MOOT	MOAN	DUES	DOTE	BOOT	BONE	NEWS	NOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
GAB	GUESS	SANK	CHAIR	JAB	JEST	THANK	CARE
TOT	FOUGHT	MAD	DONG	POT	THOUGHT	ROD	BONG
GHOST	COOP	SO	RUE	BOAST	POOP	SHOW	YOU
LIP	LEAP	RID	REEK	RIP	REAP	LID	LEEK
ZED	VAST	TENSE	CALF	SAID	FAST	DENSE	SAFF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POON	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
BANK	MET	THAD	TENT	DANK	NET	PAD	PENT
DOT	TAUGHT	MOP	YAWL	GOT	CAUGHT	POP	MALL
ROAD	LEND	LOW	ROOT	LOAD	RUDE	ROW	LOCT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHOO	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
WEED	BID	TEAK	THIN	PEEC	DIC	PEEK	FIN
SHAG	WREN	BAT	KEG	BEC	VEG	GAT	PEG
ROT	LAM	LOCK	WRONG	LOT	RAW	ROCK	LONG
VOLE	ZOO	COAT	TUNE	POAL	ZUG	GOAT	DUNZ
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
PENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
POOL	THOR	NOON	BOWL	TOOL	POKE	MOON	DOLE
WIELD	FIT	KEY	CILL	YIELD	MIT	TEA	DILL
LAP	REST	RAMP	LEND	RAP	LEST	LAMP	REND

DIAGNOSTIC R(YME TEST

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PAGE 1

GOB	COOT
TAUNT	BOND
BOOT	MOAN
CHEAT	VILL
GAB	GUEST
POT	FOUGHT
BOAST	POOP
LIP	REAP
ZED	FAST
DAM	DOCK
SHOES	THOSE
CHEEP	SING
DANK	NET
GOT	TAUGHT
ROAD	LEWD
TINT	BEAN
DECK	MAD
TONG	BOX
CHOO	GO
WEED	BID
SHAG	YEN
ROT	LAW
VOLE	SUE
NIP	DEED
PENCE	THAN
THAW	COP
TOOL	THOR
WIELD	HIT
RAP	REST

PAGE 2

YEAT	PAN
VAULT	CHOCK
NEWS	DOTE
VEE	TICK
SANK	CHAIR
ROD	DONG
SHOW	YOU
RID	LEEK
TENSE	GAFF
MOSS	MOM
POOH	DOUGH
THEE	GILT
FAD	PENT
FOP	YAWL
LOW	ROOT
GIN	PEEL
MEND	DAB
SHAW	VON
GOOSE	SOLE
TEAK	THIN
BAT	PEG
LOCK	WRONG
COAT	DUNE
BIT	MEET
DEN	CHAD
JAWS	JOT
MOON	BOWL
KEY	DILL
LAMP	LEND

PAGE 3

ROB	TOOT
DAUNT	POND
MOOT	BONE
SHEET	BILL
JAB	JEST
TOT	THOUGHT
GHOST	COOP
RIP	LEAP
BAID	VAST
GNAW	KNOCK
CHOOSE	DOZE
KEEP	THING
RANK	MET
DOT	CAUGHT
LOAD	RUDE
DINT	PEEN
NECK	BAD
THONG	VOX
COO	JOE
REED	DID
SAG	WREN
LOT	RAW
FOAL	ZOO
DIP	NEED
PENCE	DAN
SAW	CHOP
POOL	PORE
YIELD	FIT
LAP	LEST

PAGE 4

PEST	FAN
FAULT	JOCK
DUES	NOTE
BEE	THICK
THANK	CARE
WAD	BONG
SO	RUE
LID	REEK
DENSE	CALF
BOSS	BOMB
FOO	THOUGH
ZEE	JILT
THAD	TENT
MOP	WALL
ROW	LOOT
CHIN	VEAL
BEND	NAB
CHAW	BON
JUICE	THOLE
PEEK	FIN
GAT	KEG
ROCK	LONG
GOAT	TUNE
HIT	BEET
THEN	SHAD
GAUZE	GOT
NOON	DOLE
TEA	GILL
RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	TOOT	TEST	PAN	BOB	COOT	PEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
MOOT	BONE	DUES	NOTE	BOOT	MOAN	NEWS	DOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RIP	LEAP	LID	REEK	LIP	REAP	RID	LEEK
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
CANK	MET	FAD	TENT	BANK	NET	THAD	PENT
GOT	TAUGHT	FOP	YAWL	DOT	CAUGHT	MOP	WALL
ROAD	LEWD	LOW	ROOT	LOAD	RUDE	ROW	LOOT
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHOO	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SAG	WREN	GAT	KEG	SHAG	YEN	BAT	PEG
ROT	RAW	LOCK	LONG	LOT	LAW	ROCK	WRONG
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
FENCE	THAN	DEN	CHAD	FENCE	DAN	THEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
1138

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	BOB	COOT	TEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	BILL	VEE	THICK	SWEET	VILL	BEE	TICK
JAB	GUEST	THANK	CHAIR	BAR	JEST	SANK	CARE
POT	THOUGHT	ROD	BONG	TOT	FOUGHT	MAD	DONE
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
LIP	LEAP	RID	REEK	RIP	REAP	LID	LEEK
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	ZOO	DOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
DANK	MET	PAD	TENT	BANK	NET	THAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	MOP	YAWL
ROAD	LEWD	LOW	ROOT	LOAD	RUDE	ROW	LOOT
DINT	BEAN	CHIN	FEEL	TINT	PEEN	GIN	VEAL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
COO	JOE	JUICE	THOLE	CHOO	GO	GOOSE	SOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SHAG	WREW	BAT	KEG	SAG	YEN	GAT	PEG
ROT	RAW	LOCK	LONG	LOT	LAW	ROCK	WRONG
VOLE	ZOO	COAT	TUNE	FOAL	SUE	BOAT	DUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	MIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAP	REST	LAMP	LEND	LAP	LEST	RAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
115A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	BOB	TOOT	TEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
BOOT	MOAN	NEWS	DOTE	MOOT	BONE	DUES	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	JEST	THANK	CAKE	SAB	GUEST	SANK	CHAIR
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
RIP	REAP	LID	LEEK	LIP	LEAP	RID	REEK
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	POO	DOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
DANK	NET	FAD	PENT	BANK	MET	THAD	TENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	POP	WALL
LOAD	RUDE	ROW	LOOT	ROAD	LEND	LOW	ROOT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	GO	JUICE	SOLE	CHOO	JOE	GOOSE	THOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	YEN	BAT	PEG	SAG	WREN	SAT	KEG
ROT	RAW	LOCK	LONG	LOT	LAW	ROCK	WRONG
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	SAUZE	GOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
YIELD	FIT	TEA	GILL	WIELD	MIT	KEY	DILL
LAP	REST	RAMP	LEND	RAP	LEST	LAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
1198

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	TOOT	TEST	PAN	BOB	COOT	PEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MOOT	MOAN	DUES	ODTE	BOOT	BONE	NEWS	NOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
GAB	GUEST	SANK	CHAIR	JAB	JEST	THANK	CARE
POT	THOUGHT	ROD	BONG	TOT	FOUGHT	WAD	DONG
GHOST	POOP	SO	YOU	BOAST	COOP	SHOW	RUE
LIP	REAP	RID	LEEK	RIP	LEAP	LID	REEK
ZED	VAST	TENSE	CALF	BAID	FAST	DENSE	GAFF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
BANK	NET	THAD	PENT	DANK	MET	FAD	TENT
GOT	TAUGHT	FOP	YAWL	DOT	CAUGHT	MOP	WALL
LOAD	RUDE	ROW	LOOT	ROAD	LEWD	LOW	ROOT
TINT	BEAN	GIN	PEEL	DINT	PEEN	CHIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHOO	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SHAG	WREN	BAT	KEG	SAG	YEN	SAT	PEG
ROT	LAW	LOCK	WRONG	LOT	RAW	ROCK	LONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
ZIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	MIT	KEY	DILL
LAP	REST	RAMP	LEND	RAP	LEST	LAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
118A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	TEST	PAN	BOB	TOOT	PEST	FAN
TAUNT	FOND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
SAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	MAD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
LIP	REAP	RID	LEEK	RIP	LEAP	LID	REEK
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
SNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	OOZE	POO	THOUGH
KEEP	THING	ZOE	JILT	CHEEP	SING	THEE	GILT
BANK	NET	THAD	PENT	DANK	MET	FAD	TENT
GOT	TAUGHT	POP	YAWL	DOT	CAUGHT	HOP	WALL
ROAD	RUDE	LOW	LOOT	LOAD	LEWD	ROW	ROOT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHOO	JOE	GOOSE	THOLE	COO	GO	JUICE	BOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
BAS	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
LOT	LAW	ROCK	WRONG	ROT	RAW	LOCK	LONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
TOOL	THOR	MOON	BOWL	POOL	PORE	NOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	MIT	KEY	DILL
RAP	LEST	LAMP	REND	LAP	REST	RAMP	LEND

DIAGNOSTIC RHYME TEST

WORD LIST
116B

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	BOR	TOOT	TEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
TOT	FOUGHT	MAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
RIP	REAP	LID	LEEK	LIP	LEAP	RID	REEK
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAW	DOCK	BOSS	MOM	DAM	KNOCK	MOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	POO	THOUGH
CHEEP	SING	THEE	GILT	XEEP	THING	ZEE	JILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
DOT	CAUGHT	HOP	WALL	GOT	TAUGHT	POP	YAWL
LOAD	LEWD	ROW	ROOT	ROAD	RUDE	LOW	LOOT
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
CHOO	JOE	GOOSE	THOLE	COO	GO	JUICE	BOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
ROT	LAW	LOCK	WRONG	LOT	RAW	ROCK	LONG
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
WIELD	PIT	KEY	GILL	YIELD	MIT	TEA	DILL
LAP	REST	RAMP	LEND	RAP	LEST	LAMP	REND

DIAGNOSTIC RHYME TEST

WORD LIST
3A1A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	TOOT	TEST	PAN	BOB	COOT	PEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
BOOT	MOAN	NEWS	DOTE	MOOT	BONE	DUES	NOTE
CHEAT	SILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
POT	FOUGHT	ROD	DONE	TOT	THOUGHT	MAD	BONE
GHOST	COOP	BO	RUE	BOAST	POOP	SHOW	YOU
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
GOT	CAUGHT	POP	WALL	DOT	TAUGHT	MOP	YAWL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
COO	GO	JUICE	SOLE	CHEW	JOE	GOOSE	THOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SAG	WREN	GAT	KEG	SHAG	YEN	BAT	PEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
TOOL	THOR	NOON	BOWL	POOL	FORE	NOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
GNAT	REST	RAP	NED	RAT	NEST	NAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	TEST	FAN	BOB	COOT	PEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOVE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
SAB	SUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
POT	THOUGHT	ROD	BONE	TOT	FOUGHT	NAD	DONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
NILL	NEAP	RIP	WREATH	RILL	REAP	NIP	NEATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
SNAW	KNOCK	BOSS	BOMB	DAN	DOCK	MOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	SILT
BANK	MET	THAD	TENT	DANK	NET	PAD	PENT
DOT	CAUGHT	MOP	WALL	BOT	TAUGHT	POP	YAWL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	RODE	NOOSE
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
TONE	BOX	SHAW	VON	THONG	VOX	CHAN	BON
CHEW	JOE	GOOSE	THOLE	COD	GO	JUICE	SOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SHAG	YEN	BAT	PEG	SAG	WREN	SAT	KEG
KNOB	WROUGHT	ROT	SHAW	ROB	NOUGHT	NOT	RAK
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	CHOP	GAUZE	BOT	THAW	COP	JAWS	JOT
TOOL	THOR	MOON	BOWL	POOL	POKE	NOON	DOLE
WIELD	MIT	KEY	DILL	YIELD	PIT	TEA	SILL
RAT	REST	NAP	NED	BNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
302A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	TEST	PAN	BOB	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	MOAN	DUES	DOTE	ROOT	BONE	NEWS	NOTE
CHEAT	VILL	VEE	TICK	SHEET	SILL	BEE	THICK
JAB	GUEST	THANK	CHAIR	SAB	JEST	SANK	CARE
POT	FOUGHT	ROD	DONE	TOT	THOUGHT	MAD	BONE
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	HEATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
DAW	DOCK	MOSS	MOM	SNAW	KNOCK	BOSS	BOMB
CHOOSE	DOZE	POD	THOUGH	SHOES	THOSE	POOH	DOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
BANK	NET	THAD	PENT	DANK	MET	FAD	TENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	MOP	YAWL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	ROOE	NOOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	BOX	CHAW	YON	TONG	VOX	SHAW	BON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
TOOL	PORE	MOON	DOLE	POOL	THOR	NOON	BOWL
WIELD	FIT	KEY	GILL	YIELD	MIT	TEA	DILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
3028

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	TEST	PAN	BOB	TOOT	PEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	VILL	VEE	TICK	SHEET	SILL	BEE	THICK
JAB	JEST	THANK	CARE	SAB	SUEST	SANK	CHAIR
POT	POUGHT	ROD	DONE	TOT	THOUGHT	WAD	BONE
GHOST	POOP	SO	YOU	BOAST	COOP	SHOW	RUE
NILL	NEAP	RIP	WREATH	RILL	REAP	NIP	NEATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
KEEP	SING	ZEE	SILT	CHEEP	THING	THEE	JILT
BANK	MET	THAD	TENT	DANK	NET	FAD	PENT
GOT	CAUGHT	POP	WALL	DOT	TAUGHT	MOP	YAWL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
COO	GO	JUICE	BOLE	CHEK	JOE	GOOSE	THOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	PIN
SAB	WREN	SAT	KEG	SHAG	YEN	BAT	PEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
NIP	NEED	BIT	BEET	DIP	DEED	WIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
WIELD	WIT	KEY	DILL	YIELD	FIT	TEA	SILL
GNAT	REST	RAP	NED	RAT	NEST	NAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
383A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	TEST	PAN	BOB	COOT	PEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
TOT	FOUGHT	MAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	REAP	NIP	NEATH	MALL	NEAP	RIP	WREATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
DANK	NET	PAD	PENT	BANK	MET	THAD	TENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	MOP	YAWL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	RODE	NOOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
COO	JOE	JUICE	THOLE	CHEW	SO	GOOSE	SOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SHAG	YEN	BAT	PEG	SAG	WREN	BAT	KEG
KNOB	NOUGHT	ROT	RAW	ROB	WROUGHT	NOT	GNAW
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAO
THAN	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	PORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
YIELD	FIT	TEA	BILL	WIELD	MIT	KEY	DILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	GOB	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
GAB	GUEST	SANK	CHAIR	JAR	JEST	THANK	CARE
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	MAD	BONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
ZEO	VAST	TENSE	CALF	SAID	FAST	DENSE	GAFF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	OOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
BANK	NET	THAD	PENT	DANK	MET	FAD	TENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	POP	WALL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	RODE	NOOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
GNAT	NEST	RAP	RED	RAT	REST	NAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
3B4A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	BOB	TOOT	PEST	FAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
BOOT	MOAN	NEWS	DOVE	MOOT	BONE	DUES	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	JEST	BANK	CARE	JAB	GUEST	THANK	CHAIR
TOT	THOUGHT	MAD	BONG	POT	POUGHT	ROD	DONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
NILL	REAP	RIP	HEATH	RILL	HEAP	NIP	WREATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	[illegible]	WALL
ROSE	NUDE	NODE	ROOSE	[illegible]	RUDE	RODE	NOOSE
TINT	BEAN	GIN	FEEL	[illegible]	PEEN	GWIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	VOX	CHAW	SON	TONG	BOX	SHAW	VON
COO	GO	JUICE	SOLE	CHEW	JOE	GOOSE	THOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	WREN	BAT	KEG	BAG	YEN	GAT	PEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
NIP	NEED	BIT	BEET	DIP	DEED	HIT	MEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
POOL	FORE	NOON	SOLE	TOOL	THOR	MOON	BOWL
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
GNAT	NEST	RAP	RED	RAT	REST	NAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
MOOT	BONE	DUES	NOTE	ROOT	MOAN	NEWS	DOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
GAB	JEST	BANK	CARE	JAB	GUEST	THANK	CHAIR
POT	POUGHT	ROD	DONG	TOT	THOUGHT	MAD	BONG
GHOST	COOP	SO	RUE	BOAST	POOP	SHOW	YOU
RILL	REAP	NIP	NEATH	NILL	NEAP	RIP	WREATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
DANK	NET	FAD	PENT	BANK	MET	THAD	TENT
DOT	CAUGHT	HOP	WALL	GOT	TAUGHT	POP	YAWL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	RODE	ROOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	VOX	CHAN	BON	TONG	BOX	SHAW	VON
COO	JOE	JUICE	THOLE	CHEW	GO	GOOSE	SOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
TOOL	THOR	MOON	BOWL	POOL	POKE	NOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
3B5A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	ROB	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	BONE	DUES	NOTE	ROOT	MOAN	NEWS	DOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
GAB	JEST	BANK	CARE	JAR	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	REAP	NIP	NEATH	NILL	NEAP	RIP	WREATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	POO	DOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
DANK	NET	FAD	PENT	RANK	MET	THAD	TENT
DOT	TAUGHT	MOP	YAWL	GOT	CAUGHT	POP	WALL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	RODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SAG	YEN	GAT	PEG	SHAG	WREW	BAT	KEG
KNOB	NOUGHT	POT	RAW	ROB	WROUGHT	NOT	GNAW
POAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	CHOP	JAWS	GOT	RAW	COP	GAUZE	JOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
YIELD	FIT	TEA	GILL	WIELD	MIT	KEY	DILL
GNAT	REST	RAP	NED	RAT	NEST	NAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
3A3B

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	GOB	COOT	TEST	PAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	BONE	DUES	NOTE	BOOT	MOAN	NEWS	DOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	BANK	CARE
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	MAD	BONG
GHOST	POOP	SO	YOU	BOAST	COOP	SHOW	RUE
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
CHOOSE	DOZE	POO	THOUGH	SHOES	THOSE	POOH	DOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
BANK	MET	PAD	TENT	BANK	NET	THAD	PENT
GOT	TAUGHT	POP	YAWL	DOT	CAUGHT	HOP	WALL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
DINT	BEAN	CHIN	FEEL	TINT	PEEN	GIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
GNAT	REST	RAP	NED	RAT	NEST	NAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
3RDA

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOR	TOOT	TEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	MOAN	DUES	DOTE	BOOT	BONE	NEWS	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	GUEST	BANK	CHAIR	JAB	JEST	THANK	CARE
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	REAP	NIP	NEATH	NILL	NEAP	RIP	WREATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAN	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
DANK	NET	PAD	PENT	BANK	MET	THAD	TENT
DOT	CAUGHT	MOP	WALL	GOT	TAUGHT	POP	YAWL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
CHEW	JOE	GOUGE	THOLE	COO	GO	JUICE	SOLE
REED	DID	PEAK	FIN	WEED	BID	TEAK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
TOOL	THOR	MOOR	BOWL	POOL	FORE	NOON	DOLE
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
GNAT	REST	MAP	NED	RAT	NEST	NAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	ROR	TOOT	PEST	FAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
MOOT	MOAN	DUES	DOTF	ROOT	BONE	NEWS	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	JEST	THANK	CARE	GAR	GUEST	SANK	CHAIR
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
ROAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
RANK	MET	THAD	TENT	DANK	NET	FAD	PENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	FOP	WALL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	RODE	NOOSE
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SHAG	WREN	RAT	KEG	SAG	YEN	GAT	PEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
3R7A

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
BOOT	MOAN	NEWS	DOTE	MOOT	BONE	DUES	NOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
JAB	JEST	THANK	CARE	GAB	GUEST	SANK	CHAIR
POT	THOUGHT	ROD	BONG	TOT	FOUGHT	WAD	DONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	POO	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	MET	FAD	TENT	BANK	NET	THAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	HOP	YAWL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
COO	GO	JUICE	SOLE	CHEW	JOE	GOOSE	THOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
KNOB	NOUGHT	ROT	RAW	ROB	WROUGHT	NOT	GNAW
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
WIELD	MIT	KEY	DILL	YIELD	PIT	TEA	GILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	GOB	COOT	TEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
BAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	REAP	NIP	NEATH	NILL	NEAP	RIP	WREATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	NET	PAD	PENT	RANK	MET	THAD	TENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	FOP	WALL
NOSE	RUDE	RODE	NOOSE	ROSE	NUDE	NODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
CHEW	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
SABA

PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
ROOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	MAD	BONG
ROAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAM	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
DANK	NET	FAD	PENT	RANK	MET	THAD	TENT
DOT	TAUGHT	MOP	YAWL	GOT	CAUGHT	POP	WALL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
TINT	PEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	GO	GOOSE	SALE	COO	JOE	JUICE	THOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
POOL	POKE	NOON	DOLE	TOOL	THOR	MOON	BOWL
YIELD	HIT	TEA	DILL	WIELD	FIT	KEY	GILL
GNAT	REST	RAP	NED	RAT	NEST	NAP	RED

DIAGNOSTIC RHYME TEST

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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
ROOT	MOAN	NEWS	DOTE	MOOT	BONE	QUES	NOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROO	BONG
GHOST	COOP	SO	RUE	ROAST	POOP	SHOW	YOU
NILL	NEAP	RIP	WREATH	RILL	REAP	NIP	NEATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
DOT	CAUGHT	HOP	WALL	GOT	TAUGHT	POP	YAWL
NOSE	RUDE	RODE	NOOSE	ROSE	NUDE	NODE	ROOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
COO	JOE	JUICE	THOLE	CHEW	GO	GOOSE	SOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	WREN	BAT	KEG	SAG	YEN	SAT	PEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	PORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
GNAT	NEST	RAP	RED	RAT	REST	NAP	NED

DIAGNOSTIC RHYME TEST

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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOR	TOOT	TEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	BONE	DUES	NOTE	BOOT	MOAN	NEWS	DOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
GHOST	POOP	SO	YOU	ROAST	COOP	SHOW	RUE
RILL	REAP	NIP	NEATH	NILL	NEAP	RIP	WREATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	POO	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
BANK	MET	THAD	TENT	DANK	NET	FAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	HOP	YAWL
NOSE	RUDE	RODE	NOOSE	POSE	NUDE	NODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SAG	WREN	GAT	KEG	SHAG	YEN	BAT	PEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
WIELD	FIT	KEY	GILL	YIELD	MIT	TEA	DILL
GNAT	NEST	RAP	RED	RAT	REST	NAP	NED

DIAGNOSTIC RHYME TEST

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PAGE 1

GOB	TOOT
TAUNT	DOND
BOOT	BONE
CHEAT	VILL
JAB	JEST
POT	THOUGHT
BOAST	POOP
RILL	NEAP
ZED	FAST
GNAW	DOCK
SHOES	DOZE
CHEEP	SING
BANK	NET
GOT	TAUGHT
NOSE	NUDE
TINT	PEEN
NECK	BAD
THONG	VOX
COO	GO
WEED	BID
SHAG	WREN
ROB	NOUGHT
VOLE	ZOO
DIP	DEED
PENCE	DAN
SAW	CHOP
TOOL	FORE
YIELD	HIT
GNAT	NEST

PAGE 2

TEST	FAN
VAULT	CHOCK
NEWS	NOTE
VEE	TICK
THANK	CARP
ROD	BONG
SHOW	YOU
NIP	WREATH
TENSE	GAFF
BOSS	MOM
POOH	THOUGH
THEE	GILT
THAD	PENT
FOP	YAWL
ROBE	ROOSE
GIN	VEAL
BEND	NAB
CHAW	BON
JUICE	SOLE
TEAK	THIN
BAT	KEG
NOT	RAW
COAT	TUNE
MIT	MEET
THEN	SHAD
GAUZE	GOT
MOON	DOLF
TEA	DILL
RAP	RED

PAGE 3

ROB	COOT
DAUNT	POND
MOOT	MOAN
SHEET	BILL
GAR	GUEST
TOT	FOUGHT
GHOST	COOP
NILL	REAP
SAID	VAST
DAW	KNOCK
CHOOSE	THOSE
KEEP	THING
DANK	MET
DOT	CAUGHT
ROSE	RUDE
DINT	BEAN
DECK	MAD
TONG	BOX
CHEW	JOE
REED	DID
SAG	YEN
KNOB	WROUGHT
FOAL	SUE
NIP	NEED
FENCE	THAN
THAW	COP
POOL	THOR
WIELD	FIT
RAT	REST

PAGE 4

PEST	PAN
FAULT	JOCK
DUES	DOTE
BEE	THICK
SANK	CHAIR
WAD	DONG
SO	RUE
RIP	NEATH
DENSE	CALF
MOSS	BOMB
FOO	DOUGH
ZEE	JILT
PAD	TENT
HOP	WALL
NODE	NOOSE
CHIN	FEEL
MEND	DAB
SHAW	VON
GOOSE	THOLE
PEEK	FIN
GAT	PEG
ROT	GNAW
GOAT	DUNE
BIT	BEET
DEN	CHAD
JAWS	JOT
NOON	BOWL
KEY	GILL
NAP	NED

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BOB	TOOT	PEST	PAN	GOB	COOT	TEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MOOT	MOAN	DUES	DOTE	BOOT	BONE	NEWS	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
POT	THOUGHT	ROD	BONG	TOT	POUGHT	WAD	DONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
NILL	NEAP	RIP	WREATH	RILL	REAP	NIP	NEATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POON	THOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
BANK	MET	THAD	TENT	DANK	NET	FAD	PENT
GOT	CAUGHT	POP	WALL	DOT	TAUGHT	HOP	YAWL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	RODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	PEEL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
POAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	THOR	NOON	BOWL	TOOL	PORE	MOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
ROB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
MOOT	BONE	DUES	NOTE	ROOT	MOAN	NEWS	DOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	JEST	THANK	CARE	GAB	GUEST	SANK	CHAIR
TOT	THOUGHT	MAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
HILL	REAP	NIP	HEATH	NILL	NEAP	RIP	WREATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
CHOOSE	THOSE	FOO	DOUGH	SHOES	DOZE	POOH	THOUGH
KEEP	THING	ZEF	JILT	CHEEP	SING	THEE	GILT
DANK	MET	FAD	TENT	BANK	NET	THAD	PENT
DOT	CAUGHT	HOP	WALL	GOT	TAUGHT	FOP	YAWL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
TOOL	THOR	MOON	BOWL	POOL	PORE	NOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

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BOB	COOT	PEST	PAN	GOR	TOOT	TEST	FAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
BOOT	MOAN	NEWS	DOTE	MOOT	BONE	DUES	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
GNAW	DOCK	BOSS	MOM	DAW	KNOCK	MOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
DANK	MET	FAD	TENT	RANK	NET	THAD	PENT
GOT	CAUGHT	FOT	WALL	DOT	TAUGHT	HOP	YAWL
NOSE	NUDE	[illegible]	ROOSE	ROSE	RUDE	NODE	NOOSE
TINT	BEAN	GIN	PEEL	DINT	PEEN	CHIN	VEAL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
BAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

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GOB	COOT	TEST	PAN	ROB	TOOT	PEST	PAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
DANK	NET	FAD	PENT	RANK	MET	THAD	TENT
GOT	TAUGHT	FOP	YAWL	DOT	CAUGHT	HOP	WALL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	ROOE	NOOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SHAG	WREN	BAT	KEG	BAG	YEN	GAT	PEG
KNOB	NOUGHT	ROT	RAW	ROB	WROUGHT	NOT	GNAW
FOAL	SUE	GOAT	QUINE	VOLE	ZOO	COAT	TUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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ROB	TOOT	PEST	FAN	GOB	COOT	TEST	PAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
ROOT	BONE	NEWS	NOTE	HOOT	MOAN	DUES	DOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
JAB	JEST	THANK	CARE	GAB	GUEST	SANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
GHOST	POOP	SO	YOU	ROAST	COOP	SHOW	RUE
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
CHOOSE	THOSE	FOO	DOUGH	SHOES	OOZE	POOH	THOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	MOP	YAWL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	RODE	NOOSE
DINT	BEAN	CHIN	FEEL	TINT	PEEN	GIN	VEAL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	JOE	JUICE	THOLE	CHEW	GO	GOOSE	SOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SHAG	WREN	RAT	KEG	SAG	YEN	GAT	PEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	ROR	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
ROOT	MOAN	NEWS	DOTE	MOOT	BONE	DUES	NOTE
SHEET	VILL	BEF	TICK	CHEAT	BILL	VEE	THICK
JAB	GUEST	THANK	CHAIR	BAR	JEST	SANK	CARE
POT	THOUGHT	ROD	BONG	TOT	FOUGHT	WAD	DONG
ROAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
RILL	REAP	NIP	NEATH	NILL	NEAP	RIP	WREATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
BANK	MET	THAD	TENT	DANK	NET	FAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	HOP	YAWL
NOSE	RUDE	RODE	NOOSE	ROSE	NUDE	NODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
COO	GO	JUICE	SOLE	CHEW	JOE	GOOSE	THOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	NOUGHT	ROT	RAW	ROB	WROUGHT	NOT	GNAW
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
NIP	NEED	BIT	HEET	DIP	DEED	HIT	MEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
POOL	FORE	NOON	DOLE	TOOL	THOR	MOON	BOWL
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
GNAT	NEST	PAP	RED	PAT	REST	NAP	NED

DIAGNOSTIC RHYME TEST

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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	BOR	TOOT	PEST	FAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MOOT	BONE	DUES	NOTE	ROOT	MOAN	NEWS	DOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
JAB	JEST	THANK	CARE	GAB	GUEST	SANK	CHAIR
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
GHOST	COOP	BO	RUE	BOAST	POOP	SHOW	YOU
NILL	REAP	RIP	HEATH	RILL	NEAP	NIP	WREATH
ZED	VAST	TENSE	CALF	SAID	FAST	DENSE	GAFF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
DANK	MET	FAD	TENT	RANK	NET	THAD	PENT
DOT	CAUGHT	HOP	WALL	GOT	TAUGHT	FOP	YAWL
NOSE	NUDE	RODE	ROOSE	ROSE	RUDE	NODE	NOOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
CHEW	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SHAG	WREN	BAT	KEG	SAG	YEN	GAT	PEG
ROB	WOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	HIT	BEET	NIP	DEED	BIT	MEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	GOB	COOT	TEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
MOOT	MOAN	DUES	DOTE	BOOT	BONE	NEWS	NOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
JAB	JEST	THANK	CARE	GAB	GUEST	SANK	CHAIR
POT	THOUGHT	ROD	BONG	TOT	FOUGHT	WAD	DONG
GHOST	COOP	SO	RUE	ROAST	POOP	SHOW	YOU
NILL	NEAP	RIP	WREATH	RILL	REAP	NIP	NEATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
CHOOSE	DOZE	FOO	THOUGH	SHOES	THOSE	POOH	DOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
BANK	MET	THAD	TENT	DANK	NET	PAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	MOP	YAWL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	RODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	PEEL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
YIELD	FIT	TEA	GILL	WIELD	MIT	KEY	DILL
GNAT	NEST	RAP	RED	RAT	REST	NAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	TOOT	TEST	FAN	ROB	COOT	PEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MOOT	MOAN	DUFS	DOTE	ROOT	BONE	NEWS	NOTE
SWEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
GAB	JEST	SANK	CARE	JAR	GUEST	THANK	CHAIR
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
ZED	VAST	TENSE	CALF	SAID	FAST	DENSE	GAFF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
DANK	MET	FAD	TENT	RANK	NET	THAD	PENT
GOT	CAUGHT	FOP	WALL	DOT	TAUGHT	HOP	YAWL
NOSE	RUDE	RODE	NOOSE	ROSE	NUDE	NODE	ROOSE
DINT	BEAN	CHIN	FEEL	TINT	PEEN	GIN	VEAL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	DID	PEEK	FIN	WEED	RID	TEAK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	NOUGHT	ROT	RAW	ROB	WROUGHT	NOT	GNAW
FOAL	ZOO	GOAT	TUNE	VOLE	SUE	COAT	DUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
PENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
YIELD	HIT	TEA	DILL	WIELD	FIT	KEY	GILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MOOT	BONE	DUES	NOTE	ROOT	MOAN	NEWS	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
GHOST	POOP	SO	YOU	ROAST	COOP	SHOW	RUE
RILL	REAP	NIP	NEATH	NILL	NEAP	RIP	WREATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
CHOOSE	THOSE	FOD	DOUGH	SHOES	DOZE	POOH	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
RANK	MET	THAD	TENT	DANK	NET	FAD	PENT
DOT	TAUGHT	HOP	YAWL	GOT	CAUGHT	POP	WALL
NOSE	RUDE	RODE	NOOSE	ROSE	NUDE	NODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	FEEL
NECK	MAD	BEND	DAB	DECK	BAD	MEND	NAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
COO	GO	JUICE	SOLE	CHEW	JOE	GOOSE	THOLE
WEED	DID	TEAK	FIN	REED	BID	PEEK	THIN
SHAG	WREN	BAT	KEG	SAG	YEN	GAT	PEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	CHOP	JAWS	BOT	SAW	COP	GAUZE	JOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	GOB	COOT	TEST	PAN
DAUNT	BOND	FAULT	CHOCK	TAUNT	POND	VAULT	JOCK
MOOT	MOAN	DUES	DOTE	BOOT	BONE	NEWS	NOTE
CHEAT	BILL	VEF	THICK	SHEET	VILL	BEF	TICK
JAB	GUEST	THANK	CHAIR	GAB	JEST	SANK	CARE
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
ZED	VAST	TENSE	CALF	SAID	FAST	DENSE	GAFF
DAN	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	NET	FAD	PENT	RANK	MET	THAD	TENT
GOT	TAUGHT	FOP	YAWL	DOT	CAUGHT	HOP	WALL
NOSE	RUDE	RODE	NOOSE	ROSE	NUDE	NODE	ROOSE
TINT	PEEN	GIN	VEAL	DINT	BEAN	CHIN	FEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	JOE	JUICE	THOLE	CHEW	GO	GOOSE	SOLE
REED	OID	PEEK	FIN	WEED	BID	TEAK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
YIELD	MIT	TEA	DILL	WIELD	FIT	KEY	GILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
ROB	COOT	PEST	PAN	GOB	TOOT	TEST	PAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	BILL	BEF	THICK	CHEAT	VILL	VEE	TICK
JAR	GUEST	THANK	CHAIR	GAR	JEST	SANK	CARE
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	WAD	BONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
SAID	FAST	DENSE	GAFF	ZED	VAST	TENSE	CALF
DAN	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MON
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
BANK	MET	THAD	TENT	DANK	NET	FAD	PENT
DOT	TAUGHT	MOP	YAWL	GOT	CAUGHT	POP	WALL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	RODE	NOOSE
DINT	BEAN	CHIN	FEEL	TINT	PEEN	GIN	VEAL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
COO	JOE	JUICE	THOLE	CHEW	GO	GOOSE	SOLE
WEED	BID	TEAK	THIN	REED	DID	PEEK	FIN
SHAG	WREN	BAT	KEG	SAG	YEN	GAT	PEG
ROB	WROUGHT	NOT	GNAW	KNOB	NOUGHT	ROT	RAW
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
WIELD	MIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	PEST	PAN	GOB	TOOT	TEST	FAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	BILL	BEE	THICK	CHEAT	VILL	VEE	TICK
JAR	JEST	THANK	CARE	GAB	GUEST	SANK	CHAIR
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	COOP	SHOW	RUE	GHOST	POOP	SO	YOU
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
ZED	VAST	TENSE	CALF	SAID	FAST	DENSE	GAFF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	MET	FAD	TENT	BANK	NET	THAD	PENT
DOT	CAUGHT	MOP	WALL	GOT	TAUGHT	POP	YAWL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	RODE	ROOSE
TINT	BEAN	GIN	FEEL	DINT	PEEN	CHIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	BOX	CHAW	VON	TONG	VOX	SHAW	BON
CHEW	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
DIP	DEED	MIT	MEET	NIP	NEED	BIT	BEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
POOL	FORE	NOON	DOLF	TOOL	THOR	MOON	BOWL
YIELD	FIT	TEA	GILL	WIELD	HIT	KEY	DILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	ROB	TOOT	PEST	PAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	BONE	DUES	NOTE	BOOT	MOAN	NEWS	DOTE
CHEAT	VILL	VEE	TICK	SHEET	BILL	BEE	THICK
GAB	JEST	SANK	CAVE	JAB	GUEST	THANK	CHAIR
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROD	DONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
MILL	NEAP	RIP	WREATH	PILL	REAP	NIP	NEATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAT	KNOCK	BOSS	BOMB	DAM	DOCK	MOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
KEEP	SING	ZEE	GILT	CHEEP	THING	THEE	JILT
BANK	NET	THAD	PENT	DANK	MET	PAD	TENT
GOT	TAUGHT	POP	YAWL	DOT	CAUGHT	HOP	WALL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	RODE	ROOSE
DINT	PEEN	CHIN	VEAL	TINT	BEAN	GIN	PEEL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAW	BON
CHEW	GO	GOOSE	SOLE	COO	JOE	JUICE	THOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
VOLE	ZOO	COAT	TUNE	FOAL	SUE	GOAT	DUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
PENCIL	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
YIELD	MIT	TEA	DILL	WIELD	FIT	KEY	GILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	TOOT	TEST	PAN	BOB	COOT	PEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
MODY	MOAN	DUES	DOTE	ROOT	BONE	NEWS	NOTE
CHEAT	BILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
TOT	FOUGHT	MAD	DONG	POT	THOUGHT	ROD	BONG
BOAST	POOP	SHOW	YOU	GHOST	COOP	SO	RUE
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
ZED	FAST	TENSE	GAFF	SAID	VAST	DENSE	CALF
GNAW	KNOCK	BOSS	BOMB	DAW	DOCK	MOSS	MOM
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
KEEP	THING	ZEE	JILT	CHEEP	SING	THEE	GILT
DANK	NET	FAD	PENT	BANK	MET	THAD	TENT
GOT	TAUGHT	POP	YAWL	DOT	CAUGHT	HOP	WALL
NOSE	RUDE	RODE	NOOSE	ROSE	NUDE	NODE	ROOSE
DINT	BEAN	CHIN	PEEL	TINT	PEEN	GIN	VEAL
DECK	BAD	MEND	NAB	NECK	MAD	BEND	DAB
THONG	VOX	CHAW	BON	TONG	BOX	SHAW	VON
COO	JOE	JUICE	THOLE	CHEW	GO	GOOSE	SOLE
AFED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SHAG	WREN	BAT	KEG	SAG	YEN	GAT	PEG
KNOB	NOUGHT	ROT	RAW	ROB	WROUGHT	NOT	GNAW
VOLE	SUE	COAT	DUNE	FOAL	ZOO	GOAT	TUNE
DIP	DEED	HIT	MEET	NIP	NEED	BIT	BEET
PENCE	THAN	THEN	CHAD	FENCE	DAN	DEN	SHAD
SAW	CHOP	GAUZE	GOT	THAW	COP	JAWS	JOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
RAT	NEST	NAP	RED	GNAT	REST	RAP	NED

DIAGNOSTIC RHYME TEST

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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	COOT	TEST	PAN	ROB	TOOT	PEST	FAN
TAUNT	BOND	VAULT	CHOCK	DAUNT	POND	FAULT	JOCK
MOOT	MOAN	DUES	DOTE	ROOT	BONE	NEWS	NOTE
CHEAT	VILL	VEF	TICK	SHEET	BILL	BEE	THICK
JAB	JEST	THANK	CARE	GAB	GUEST	BANK	CHAIR
TOT	THOUGHT	WAD	BONG	POT	FOUGHT	ROO	DONG
BOAST	POOP	SHON	YOU	GHOST	COOP	SO	RUE
RILL	NEAP	NIP	WREATH	NILL	REAP	RIP	NEATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAW	KNOCK	MOSS	BOMB	GNAW	DOCK	BOSS	MOM
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	POO	THOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
DARK	MET	PAD	TENT	BANK	NET	THAD	PENT
GOT	CAUGHT	POP	WALL	DOT	TAUGHT	HOP	YAWL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	ROBE	ROOSE
TINT	PEEN	GIN	VEAL	MINT	BEAN	CHIN	FEEL
NECK	BAD	BEND	MAB	DECK	MAD	MEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
CHEW	JOE	GOOSE	THOLE	COO	GO	JUICE	SOLE
REED	BID	PEEK	THIN	WEED	DID	TEAK	FIN
BAG	WREN	GAT	KEG	SHAG	YEN	BAT	PEG
ROB	NOUGHT	NOT	RAW	KNOB	WROUGHT	ROT	GNAW
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
NIP	NEED	BIT	BEET	DIP	DEED	MIT	MEET
PENCE	DAN	THEN	SHAD	FENCE	THAN	DEN	CHAD
THAW	CHOP	JAWS	GOT	SAW	COP	GAUZE	JOT
TOOL	FORE	MOON	DOLE	POOL	THOR	NOON	BOWL
WIELD	FIT	KEY	GILL	YIELD	HIT	TEA	DILL
GNAT	REST	RAP	NED	RAT	NEST	NAP	RED

DIAGNOSTIC RHYME TEST

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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
GOB	COOT	TEST	PAN	ROB	TOOT	PEST	FAN
TAUNT	POND	VAULT	JOCK	DAUNT	BOND	FAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
CHEAT	SILL	VEE	THICK	SHEET	VILL	BEE	TICK
GAB	JEST	SANK	CARE	JAB	GUEST	THANK	CHAIR
TOT	FOUGHT	WAD	DONG	POT	THOUGHT	ROD	BONG
GHOST	COOP	BO	RUE	BOAST	POOP	SHOW	YOU
NILL	NEAP	RIP	WREATH	RILL	REAP	NIP	NEATH
SAID	VAST	DENSE	CALF	ZED	FAST	TENSE	GAFF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	THOSE	POOH	DOUGH	CHOOSE	DOZE	FOO	THOUGH
CHEEP	SING	THEE	GILT	KEEP	THING	ZEE	JILT
DANK	NET	PAD	PENT	BANK	MET	THAD	TENT
DOT	CAUGHT	MOP	WALL	GOT	TAUGHT	POP	YAWL
ROSE	NUDE	NODE	ROOSE	NOSE	RUDE	RODE	NOOSE
DINT	BEAN	CHIN	PEEL	TINT	PEEN	GIN	VEAL
DECK	MAD	MEND	DAB	NECK	BAD	BEND	NAB
TONG	BOX	SHAW	VON	THONG	VOX	CHAN	BON
COO	GO	JUICE	SOLE	CHEW	JOE	GOOSE	THOLE
REED	DID	PEEK	FIN	WEED	BID	TEAK	THIN
SAG	YEN	GAT	PEG	SHAG	WREN	BAT	KEG
KNOB	NOUGHT	ROT	RAW	ROB	WROUGHT	NOT	GNAW
FOAL	SUE	GOAT	DUNE	VOLE	ZOO	COAT	TUNE
NIP	DEED	BIT	MEET	DIP	NEED	MIT	BEET
FENCE	DAN	DEN	SHAD	PENCE	THAN	THEN	CHAD
SAW	COP	GAUZE	JOT	THAW	CHOP	JAWS	GOT
TOOL	THOR	MOON	BOWL	POOL	FORE	NOON	DOLE
YIELD	HIT	TEA	DILL	WIELD	FIT	KEY	GILL
RAT	REST	NAP	NED	GNAT	NEST	RAP	RED

DIAGNOSTIC RHYME TEST

WORD LIST
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PAGE 1		PAGE 2		PAGE 3		PAGE 4	
BOB	TOOT	PEST	PAN	GOR	COOT	TEST	PAN
DAUNT	POND	FAULT	JOCK	TAUNT	BOND	VAULT	CHOCK
BOOT	BONE	NEWS	NOTE	MOOT	MOAN	DUES	DOTE
SHEET	VILL	BEE	TICK	CHEAT	BILL	VEE	THICK
GAB	JEST	BANK	CARE	JAB	GUEST	THANK	CHAIR
POT	FOUGHT	ROD	DONG	TOT	THOUGHT	MAD	BONG
GHOST	POOP	SO	YOU	BOAST	COOF	SHOW	RUE
NILL	REAP	RIP	NEATH	RILL	NEAP	NIP	WREATH
ZED	VAST	TENSE	CALF	SAID	FAST	DENSE	GAFF
DAW	DOCK	MOSS	MOM	GNAW	KNOCK	BOSS	BOMB
SHOES	DOZE	POOH	THOUGH	CHOOSE	THOSE	FOO	DOUGH
CHEEP	THING	THEE	JILT	KEEP	SING	ZEE	GILT
DANK	MET	FAD	TENT	BANK	NET	THAD	PENT
GOT	TAUGHT	POP	YAWL	DOT	CAUGHT	HOP	WALL
ROSE	RUDE	NODE	NOOSE	NOSE	NUDE	RODE	ROOSE
TINT	BEAN	GIN	FEEL	OINT	PEEN	CHIN	VEAL
NECK	BAD	BEND	NAB	DECK	MAD	MEND	DAB
TONG	VOX	SHAW	BON	THONG	BOX	CHAW	VON
COD	JOE	JUICE	THOLE	CHEW	GO	GOOSE	SOLE
REED	DID	PEAK	FIN	WEED	BID	TEAK	THIN
SHAG	YEN	BAT	PEG	SAG	WREN	GAT	KEG
KNOB	WROUGHT	ROT	GNAW	ROB	NOUGHT	NOT	RAW
VOLE	ZOO	COAT	THUP	FOAL	SUE	GOAT	DUNE
DIP	NEED	MIT	BEET	NIP	DEED	BIT	MEET
FENCE	THAN	DEN	CHAD	PENCE	DAN	THEN	SHAD
THAW	COP	JAWS	JOT	SAW	CHOP	GAUZE	GOT
POOL	THOR	NOON	BOWL	TOOL	FORE	MOON	DOLE
WIELD	HIT	KEY	DILL	YIELD	FIT	TEA	GILL
GNAT	REST	RAP	NED	BAT	NEST	NAP	RED

Appendix B

Diagnostic Rhyme Test
Scoring Software
and
Sample Printout
CSP-30 Implementation

```
C
C
C       DIAGNOSTIC RHYME TEST SCORING PROGRAM
C       WITH CARTRIDGE OUTPUT
C
C       CSP-30 IMPLEMENTATION
C
C
C                                                    5 MAR 76
C
C
C       FOR INFORMATION CONCERNING THIS PROGRAM CONTACT:
C
C                       CAPTAIN STEVEN MEISTER
C                       ESD/MCE
C                       HANSCOM AFB, MA 01731
C
C                       TELEPHONE:
C                           COMM, (617) 861-4433
C                           AUTOVON     478-4433
C
C
C
C
C       WRITTEN BY STEVEN MEISTER, ESD/DCWL, HANSCOM AFB, MA 01731
C
C
C
C       NUMSUB = NUMBER OF SUBFEATURES CORRECT EACH LISTENER
C       NUMT = NUMBER OF MAIN FEATURES CORRECT EACH LISTENER
C       NUML = NUMBER OF LISTENERS
C       NUMS = NUMBER OF SPEAKERS
C       LIST = CURRENT LISTENER
C       ISPKR = CURRENT SPEAKER
C       IKEY = CURRENT KEY NUMBER
C       NKEY = CURRENT KEY INDEX NUMBER FOR KEY ARRAY
C       IPAGE = PAGE BEING SCORED
C       IFEAT = INDEX FOR MAIN FEATURE:
C                       1 = VOICING
C                       2 = NASALITY
C                       3 = SUSTENTION
C                       4 = SIBILATION
C                       5 = GRAVENESS
C                       6 = COMPACTNESS
C                       7 = EXPERIMENTAL
C
C       FEATURE ARRAY KEY:
C
C                       PRESENT ABSENT
C       MAIN FEATURE    (L,1,1) (L,2,1)     L = LISTENER NUMBER
C       SUB FEAT PRES   (L,1,2) (L,2,2)
C       SUB FEAT ABS    (L,1,3) (L,2,3)
C
C       FEAT(19,N,M) = MEAN FOR N,M
C       FEAT(20,N,M) = STANDARD ERROR FOR N,M
C       FEAT(18,1,M) = MEAN FOR PRESENT + ABSENT STATE OF M
C       FEAT(18,2,M) = S.E. FOR PRESENT + ABSENT STATE OF M
C       TOT(1,I) = TOTAL FOR PRESENT STATE ALL FEATURES
C       TOT(2,I) = TOTAL FOR ABSENT STATE ALL FEATURES
C       TOT(3,I) = TOTAL FOR PRESENT + ABSENT ALL FEATURES
C                       WHERE   I = 1 FOR MEAN
C                               I = 2 FOR S.E.
```

```
C
C
C
C       PAGE(I,J,K) AND NPAGE(I,J,K)!
C                       I = FEATURE
C                       J = 1!PRESENT  2!ABSENT
C                       K = 1!MAIN  2!SUB PRES  3!SUB ABS
C
C
C
      DIMENSION KEY(58,60),KEYSUB(58,2)
      COMMON IRESP(2,29),VOIC(20,2,3),XNASAL(20,2,3),SUST(20,2,3),
     1 SIBIL(20,2,3),GRAV(20,2,3),COMP(20,2,3),EXPER(20,2),TOT(3,2),
     1 ISYSTE(50),NAME(12,24),NPAGE(7,2,3),PAGE(7,2,3)
C
C       102 A KEY
      DATA KEY/0,0,1,1,0,1,1,0,1,0,1,0,1,1,0,1,4*0,
     1 1,1,10*0,1,1,0,1,3*0,1,0,3*1,6*0,1,1,0,1,0,1,1,0,
C
C       102 B KEY
     1 1,0,1,1,0,1,0,0,4*1,0,1,0,0,1,3*0,4*1,
     1 0,1,0,1,1,0,1,0,0,0,1,1,0,0,1,0,1,1,3*0,1,3*0,1,1,3*0,4*1,0,
C
C       103 A KEY
     1 7*1,3*0,4*1,0,1,1,0,1,0,1,0,0,4*1,0,0,
     1 1,1,0,0,1,1,0,1,1,5*0,1,1,0,1,0,0,3*1,0,1,3*0,1,
C
C       103 B KEY
     1 5*1,0,1,1,0,1,0,1,1,0,5*1,0,1,0,4*1,
     1 4*0,1,1,0,1,1,0,0,1,0,0,1,5*0,1,0,1,0,1,0,0,3*1,0,0,
C
C       104 A KEY
     1 4*0,1,0,1,0,1,1,0,1,3*0,1,1,0,1,1,0,0,
     1 1,0,0,1,0,0,1,0,1,1,3*0,1,1,0,1,3*0,3*1,0,0,1,0,5*1,3*0,1,
C
C       104 B KEY
     1 5*1,4*0,3*1,0,0,1,1,0,1,0,4*1,0,0,1,1,
     1 0,0,3*1,0,1,0,4*1,0,1,1,0,1,0,1,0,0,1,5*0,1,0,1,0,
C
C       105 A KEY
     1 0,3*1,0,0,3*1,0,1,1,0,0,1,1,0,0,1,0,1,
     1 0,1,0,1,1,0,0,1,0,0,1,1,0,0,1,1,0,10*1,5*0,5*1,
C
C       105 B KEY
     1 0,1,0,4*1,0,1,3*0,3*1,3*0,1,0,1,1,0,1,
     1 0,1,0,1,0,1,1,0,1,1,0,1,0,0,1,4*0,3*1,0,1,1,9*0,
C
C       106 A KEY
     1 0,3*1,0,0,1,0,1,0,0,1,0,1,0,1,0,0,1,0,1,0,1,0,3,3*1,0,
     1 0,0,4*1,0,1,0,1,0,1,6*0,3*1,0,1,0,0,3*1,0,
C
C       106 B KEY
     1 3*1,0,1,0,0,11*1,5*0,1,3*0,1,1,
     1 1,0,1,1,0,1,0,1,0,1,0,1,1,0,1,3*0,1,0,1,1,4*0,1,0,0,
C
C       107 A KEY
     1 0,1,0,0,1,1,4*0,1,0,0,1,1,4*0,1,0,1,0,0,1,0,3*1,
     1 0,0,3*1,0,0,1,1,0,0,1,0,4*1,0,3*1,0,0,1,1,0,0,1,1,
C
C       107 B KEY
     1 1,0,1,0,1,1,0,1,1,0,0,1,0,1,0,1,0,4*1,0,1,1,0,1,1,0,1,
     1 0,0,1,0,1,0,1,1,0,1,0,0,1,0,1,0,0,5*1,0,1,0,0,3*1,
C
C       108 A KEY
```

```
     1  1,3*0,3*1,0,1,4*0,1,0,1,0,0,1,1,0,0,1,1,0,3*1,0,
     1  3*1,3*0,5*1,0,1,1,0,1,0,0,1,0,1,4*0,4*1,
C
C       108 B KEY
     1  0,0,1,1,3*0,3*1,0,0,1,1,3*0,5*1,0,1,0,0,3*1,
     1  0,0,3*1,5*0,1,0,1,1,0,0,3*1,0,3*1,0,0,1,1,0,1,
C
C       111 A KEY
     1  1,1,0,0,3*1,3*0,3*1,3*0,1,0,1,0,0,1,
     1  3*0,3*1,0,0,6*1,0,1,0,1,1,3*0,4*1,0,0,3*1,0,0,1,0,1,
C
C       111 B KEY
     1  0,0,3*1,3*0,1,0,1,0,1,1,4*0,1,1,0,1,0,
     1  3*1,0,3*1,0,1,0,1,7*0,1,1,0,1,1,5*0,1,0,0,1,0,1,1,
C
C       112 A KEY
     1  1,3*0,1,1,3*0,3*1,0,1,1,0*0,1,5*0,1,0,
     1  0,1,0,0,1,5*0,1,1,0,1,0,1,0,0,1,0,1,4*0,4*1,
C
C       112 B KEY
     1  0,4*1,0,1,0,0,1,0,0,1,0,4*1,3*0,1,3*0,4*1,
     1  4*0,1,0,4*1,0,0,1,1,3*0,1,1,3*0,1,1,0,1,1,0,1,
C
C       113 A KEY
     1  3*0,6*1,0,0,1,1,0,3*1,0,0,3*1,0,1,0,1,
     1  0,0,1,1,0,3*1,0,1,0,0,3*1,0,1,0,1,1,0,4*1,3*0,1,0,1,1,
C
C       113 B KEY
     1  1,0,1,1,0,0,1,0,1,1,0,1,1,0,1,0,4*1,
     1  0,1,0,1,0,1,0,9*1,0,1,0,1,6*0,1,0,3*1,0,1,4*0,1,
C
C       115 A KEY
     1  1,0,1,1,0,5*1,0,0,1,1,0,0,1,0,1,1,0,1,0,3*1,3*0,
     1  0,1,0,1,3*0,4*1,0,4*1,0,0,1,0,0,1,3*0,1,0,1,1,
C
C       115 B KEY
     1  4*0,1,4*0,3*1,3*0,1,1,4*0,1,0,3*1,3*0,
     1  1,1,0,0,4*1,4*0,3*1,0,1,0,3*1,0,3*1,0,3*1,
C
C       116 A KEY
     1  0,4*1,0,1,0,1,0,0,1,0,0,1,0,1,3*0,1,0,0,1,0,1,1,0,1,
     1  0,1,1,3*0,4*1,0,5*1,6*0,1,0,4*1,0,
C
C       116 B KEY
     1  3*1,0,0,3*1,5*0,1,3*0,1,0,1,0,1,0,1,1,0,0,1,0,
     1  0,0,3*1,0,0,3*1,0,0,1,0,0,1,0,1,0,1,0,0,1,0,1,0,3*1,
C
C       301 A KEY
     1  0,0,1,1,1,0,0,0,1,0,0,1,0,0,0,1,1,0,1,0,1,0,0,1,1,0,1,0,0,
     1  1,0,0,1,1,0,0,0,1,0,1,1,1,0,0,0,0,1,1,1,1,1,0,0,0,1,1,1,1,1,
C
C       301 B KEY
     1  0,0,1,1,1,0,1,1,0,0,0,1,0,1,1,1,1,1,0,1,0,0,0,0,0,0,1,1,1,
     1  1,1,1,0,1,1,0,0,1,0,1,1,0,0,0,1,0,1,0,1,0,0,1,0,1,0,1,0,1,
C
C       302 A KEY
     1  0,1,0,1,0,0,1,0,1,1,1,1,0,0,1,1,1,0,0,1,0,1,0,0,1,0,1,1,1,
     1  0,0,0,0,1,0,0,0,1,1,1,0,1,0,0,0,1,1,0,0,0,1,0,0,1,0,0,1,1,
C
C       302 B KEY
     1  0,0,1,1,0,0,0,1,0,1,1,1,0,0,0,0,1,1,1,0,1,0,0,0,1,0,0,1,0,
     1  0,1,1,0,0,0,1,0,1,0,1,0,0,0,0,1,0,1,1,0,1,0,0,0,1,1,1,0,1,
C
C       303 A KEY
```

```
     1  0,0,1,0,0,1,1,0,0,1,0,0,1,0,1,1,0,0,1,0,0,0,1,1,1,1,0,0,1,
     1  1,0,1,1,1,0,1,1,1,1,0,1,1,0,0,0,0,1,0,0,1,0,1,1,0,0,1,1,
C
C       303 B KEY
     1  0,1,1,1,1,0,1,1,0,0,1,0,0,1,1,1,0,0,0,0,0,1,0,0,0,1,0,1,0,
     1  0,0,1,0,1,0,0,1,0,0,1,0,1,1,0,0,1,0,0,0,0,1,0,0,0,1,0,0,0,
C
C       304 A KEY
     1  0,1,1,1,1,1,1,1,0,1,1,0,0,1,1,1,1,0,1,1,0,1,1,0,0,0,0,0,0,
     1  0,1,0,1,0,1,1,1,1,1,1,1,1,1,0,0,1,0,1,0,1,1,1,0,0,0,0,1,0,
C
C       304 B KEY
     1  1,1,0,1,1,0,0,0,1,0,0,0,1,1,1,1,1,1,0,1,0,1,1,0,1,1,1,1,1,1,
     1  0,1,1,0,0,0,0,1,1,0,0,1,1,0,1,0,1,0,0,0,0,0,0,0,0,1,0,1,
C
C       305 A KEY
     1  0,1,0,0,1,0,1,0,1,1,0,1,1,1,1,0,0,1,0,1,1,0,1,1,1,1,0,0,0,
     1  0,0,1,0,0,0,1,1,1,0,1,0,1,1,1,1,1,0,0,0,0,1,1,0,1,0,0,1,1,
C
C       305 B KEY
     1  1,1,0,1,0,0,0,1,1,1,1,1,1,0,0,0,1,1,0,1,1,1,1,1,1,0,1,1,1,0,
     1  1,0,1,0,1,0,1,1,1,0,1,0,0,1,0,0,1,0,1,0,0,1,1,1,1,0,1,
C
C       306 A KEY
     1  1,1,0,1,1,1,1,1,0,1,1,1,0,1,1,0,1,1,1,0,1,1,0,0,0,1,0,1,1,0,
     1  0,0,0,1,1,1,1,1,1,0,0,0,0,1,0,0,0,0,0,0,0,1,0,0,0,1,1,0,1,1,1,
C
C       306 B KEY
     1  0,1,0,1,0,1,1,0,1,0,1,1,0,1,1,1,0,0,0,1,0,1,1,0,1,0,1,0,1,
     1  0,1,0,1,0,1,1,0,1,1,1,0,0,1,0,1,1,0,1,1,1,1,0,1,0,1,1,1,1,1,
C
C       307 A KEY
     1  1,1,1,0,0,0,1,1,1,0,0,1,1,0,0,1,1,1,1,1,0,0,0,1,1,1,1,1,0,1,1,
     1  0,1,0,0,0,1,0,1,0,1,1,1,1,0,0,0,1,1,1,1,1,1,1,0,1,0,1,0,1,1,0,0,
C
C       307 B KEY
     1  1,0,1,1,1,0,1,0,1,1,1,1,1,1,1,0,0,1,0,0,0,1,1,0,1,1,1,0,0,1,1,
     1  1,1,1,0,0,0,1,1,0,1,0,1,1,1,1,1,1,0,1,1,1,1,0,0,1,0,0,1,0,1,0,
C
C       308 A KEY
     1  1,0,1,0,1,0,1,0,1,1,0,0,1,1,0,1,1,0,0,1,1,1,0,0,0,0,0,0,0,0,
     1  0,1,1,1,0,0,1,0,0,1,1,1,1,1,1,0,1,0,0,1,0,0,1,1,0,1,1,0,0,1,
C
C       308 B KEY
     1  1,1,1,1,1,1,0,1,0,0,1,0,0,1,0,1,1,1,1,1,1,0,1,0,0,1,1,0,1,0,
     1  0,0,0,0,0,0,0,0,0,1,0,0,1,1,0,1,0,1,0,0,0,1,0,0,1,0,0,0,0,0,
C
C       309 A KEY
     1  1,1,0,0,1,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,1,1,0,
     1  0,0,1,0,0,0,1,1,0,0,0,1,0,0,1,1,1,0,0,0,1,0,0,0,0,0,1,1,0,
C
C       309 B KEY
     1  0,1,1,1,1,0,0,1,0,0,0,0,0,0,0,0,0,0,1,0,0,1,0,1,1,1,0,1,0,0,
     1  1,0,1,0,0,0,1,1,0,1,1,1,0,1,1,0,1,1,0,1,0,1,1,0,1,1,0,0,0,0,
C
C       310 A KEY
     1  1,0,0,1,0,0,1,1,0,1,1,1,0,0,1,0,0,0,0,0,1,1,1,1,0,0,1,0,0,1,
     1  1,1,0,1,1,1,1,0,0,1,0,0,1,0,0,1,1,0,1,0,1,0,0,0,1,0,1,0,0,1,1,0,
C
C       310 B KEY
     1  1,0,0,1,0,1,1,0,0,0,1,1,1,1,1,0,0,1,0,0,1,0,0,0,1,1,1,1,1,1,1,
     1  0,0,1,1,0,1,1,1,1,1,0,1,0,0,0,1,1,0,0,0,0,0,1,0,0,1,1,1,0,1,
C
C       311 A KEY
```

```
     1  1,0,1,1,1,1,1,0,1,0,0,0,1,0,0,1,1,0,0,1,0,1,0,0,1,1,1,1,1,
     1  0,0,0,1,0,1,0,0,1,1,0,1,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,0,0,
C
C       311 B KEY
     1  0,1,1,1,0,1,1,1,1,0,0,1,1,0,1,0,1,0,0,0,0,0,1,1,1,1,0,0,1,
     1  0,0,1,1,1,0,1,1,1,0,0,0,1,1,0,1,1,0,0,1,1,1,1,1,0,1,0,0,1,1,
C
C       312 A KEY
     1  1,1,1,0,0,0,0,1,1,1,1,0,0,0,1,0,0,0,1,1,0,1,1,1,0,0,0,1,1,
     1  1,1,1,0,0,0,0,1,1,0,1,0,0,1,0,0,0,1,0,0,1,1,1,1,1,1,0,0,1,0,
C
C       312 B KEY
     1  0,1,1,0,0,0,0,1,0,1,0,0,0,0,0,0,0,0,0,0,1,0,1,0,1,0,1,0,0,0,1,0,
     1  0,0,0,0,1,1,0,1,1,0,1,0,0,0,1,1,0,1,1,1,0,1,0,0,0,1,0,1,0,
C
C       313 A KEY
     1  0,0,0,1,0,1,0,1,0,0,1,1,1,1,0,1,0,1,0,1,0,1,0,1,0,0,0,0,1,1,
     1  0,1,1,1,0,1,0,1,0,0,1,0,0,0,0,0,1,0,1,1,1,1,0,0,0,1,1,1,0,
C
C       313 B
     1  1,0,0,1,0,0,0,1,1,0,1,0,0,0,1,0,1,0,0,0,1,0,1,1,0,0,1,0,0,
     1  1,0,0,0,0,1,0,0,0,0,1,0,0,0,1,1,0,0,0,1,0,0,0,1,1,1,1,1,0,
C
C       314 A KEY
     1  0,0,0,0,1,1,1,0,0,1,0,0,1,0,0,0,0,0,0,1,1,0,1,0,0,0,1,0,1,
     1  1,1,0,0,0,1,1,0,0,1,1,1,0,0,1,0,0,0,0,1,0,1,0,1,0,0,0,0,1,
C
C       314 B KEY
     1  1,0,0,0,1,0,0,0,1,1,1,0,0,1,0,0,0,0,1,0,0,1,0,0,1,1,1,1,1,
     1  0,1,1,1,0,0,1,1,1,1,0,1,0,1,1,1,0,1,1,1,1,0,1,1,0,0,0,0,1,
C
C       315 A KEY
     1  1,0,0,1,0,1,1,0,0,1,0,1,1,0,0,1,0,0,1,1,1,0,1,1,0,0,1,0,1,
     1  1,0,0,1,1,0,1,0,0,1,1,1,1,1,1,1,1,0,0,1,0,0,1,0,1,1,0,0,0,
C
C       315 B KEY
     1  1,1,1,0,0,0,1,1,1,1,0,0,0,1,1,0,0,1,1,0,0,1,0,1,1,1,1,1,1,
     1  0,1,1,1,1,0,0,1,1,0,0,0,0,1,0,0,1,0,0,0,1,0,1,1,0,0,0,0,1,
C
C       316 A KEY
     1  1,1,1,0,0,1,1,1,0,0,0,1,1,1,1,1,1,0,0,1,1,0,1,1,0,0,0,0,1,
     1  0,1,1,1,0,1,0,1,0,0,1,1,0,0,1,0,1,1,1,0,0,0,1,1,1,0,0,1,0,
C
C       316 B KEY
     1  0,1,0,1,1,1,1,1,0,0,0,1,0,0,1,0,0,1,0,1,1,0,0,1,1,1,0,0,1,
     1  0,0,1,0,0,1,1,0,1,0,1,0,1,1,1,1,1,1,1,1,0,0,0,0,0,1,1,0,1,
C
C       317 A KEY
     1  0,0,0,1,1,1,1,0,0,0,0,1,1,0,0,0,1,0,1,1,0,0,0,1,1,0,1,1,1,
     1  1,1,0,1,0,0,1,0,1,0,1,1,1,1,1,1,0,1,0,0,1,1,1,1,1,0,0,1,0,0,
C
C       317 B KEY
     1  0,1,0,1,0,1,1,0,1,1,0,0,1,0,1,1,0,1,0,1,1,1,1,1,0,1,1,1,1,0,
     1  0,0,0,0,0,1,1,0,0,0,0,1,0,0,1,1,1,0,0,0,1,1,1,0,1,0,0,1,1,
C
C       318 A KEY
     1  0,1,1,1,1,1,0,1,1,1,0,0,1,1,1,1,0,1,1,1,1,1,0,1,0,0,0,1,0,1,
     1  0,1,1,1,0,0,0,0,0,1,0,0,1,0,0,0,0,1,1,1,0,1,1,1,1,1,1,0,1,
C
C       318 B KEY
     1  1,0,1,0,1,0,0,1,0,1,0,0,1,0,1,1,0,1,1,1,0,0,0,1,0,1,0,1,0,
     1  1,1,1,0,0,0,1,1,0,1,1,1,0,1,1,0,1,0,0,1,0,0,0,0,0,1,1,0,1/
C
C       SUB FEATURES KEY
```

```
      DATA KEYSUB/0,0,1,0,1,0,3*1,3*0,1,1,5*0,1,0,1,1,4*0,1,3*0,3*1,
     1  3*0,1,0,1,0,1,3*0,7*1,0,1,4*0,1,1,0,1,0,1,3*0,1,0,1,3*0,1,1,
     1  0,1,0,1,1,0,4*1,3*0,1,3*0,3*1,0,3*1,0,3*1,0,1,5*0,1,0,4*1/
      CRCT(X,Y) = (2.*X/Y - 1.)*100.
      SE(X,Y,Z) = SQRT((X/Z*Y*Y)/Z)
      DO 1 I=1,20
      DO 1 J=1,2
      EXPER(I,J)=0.
      DO 1 K=1,3
      VOIC(I,J,K)=0.
      XNASAL(I,J,K)=0.
      SUST(I,J,K)=0.
      SIBIL(I,J,K)=0.
      GRAV(I,J,K)=0.
      COMP(I,J,K)=0.
1     CONTINUE
      DO 315 I=1,3
      DO 315 J=1,2
315   TOT(I,J)=0.
!     02420,0116000,014
      WRITE(6,270)
270   FORMAT(30X,'DIAGNOSTIC RHYME TEST'///)
      WRITE(6,271)
271   FORMAT('LISTENER SUMMARIES!')
!     02400,0116000,014
      WRITE(5,100)
100   FORMAT(//'     DIAGNOSTIC RHYME TEST SCORING'//)
      WRITE(5,600)
600   FORMAT('INSERT 150 FT CARTRIDGE IN UPPER DECK!/
     1  '1/0 RESET - CONTINUE'//)
      PAUSE
      WRITE(5,1000)
1000  FORMAT('SYSTEM UNDER TEST?'/'  ',50('S'))
      READ(5,1001)(ISYSTE(I),I=1,50)
1001  FORMAT(50A1)
      WRITE(5,101)
101   FORMAT('HOW MANY LISTENERS?'/'  LL')
      READ(5,102)NUML
102   FORMAT(I2)
      WRITE(5,103)
103   FORMAT(/'HOW MANY SPEAKERS?'/'  SS')
      READ(5,102)NUMS
      NUMT = 16*NUMS
      NUMSUB = 8*NUMS
      WRITE(7,601)(ISYSTE(I),I=1,50),NUML,NUMS
601   FORMAT(50A1,2I3)
      DO 200 LIST = 1,NUML
      WRITE(6,3001)
      WRITE(6,3000)(ISYSTE(I),I=1,50)
3000  FORMAT(/50A1)
3001  FORMAT('    ')
      WRITE(5,2000)LIST
2000  FORMAT(/'LISTENER',I3,' NAME'/'  ',24('N'))
      READ(5,2001)(NAME(LIST,J),J=1,24)
2001  FORMAT(24A1)
      WRITE(6,275)LIST,(NAME(LIST,J),J=1,24)
      WRITE(7,2001)(NAME(LIST,J),J=1,24)
      DO 201 ISPKR = 1,NUMS
      DO 610 I=1,7
      DO 610 J=1,2
      DO 610 K=1,3
610   PAGE(I,J,K) = 0.0
107   WRITE(5,104)LIST,ISPKR
```

```
104     FORMAT(/'FOR LISTENER',I3,' SPEAKER',I3//
     1  'ENTER KEY NUMBER AND LETTER'/'  NNNL')
        READ(5,105)IKEY,LETTER
105     FORMAT(I3,A1)
475     FORMAT(//6X,'****',16X,'**'/'KEY = ',I3,A1,
     1  5X,'SPEAKER IS ',A2/6X,'****',16X,'**'//'IF OK ENTER 0'/)
476     FORMAT(I1)
        IF(IKEY.EQ.102)NKEY = 10+MSPK+'BV'+GOTO 150
        IF(IKEY.EQ.103)NKEY = 30+MSPK+'BV'+GOTO 150
        IF(IKEY.EQ.104)NKEY = 50+MSPK+'RD'+GOTO 150
        IF(IKEY.EQ.105)NKEY = 70+MSPK+'RD'+GOTO 150
        IF(IKEY.EQ.106)NKEY = 90+MSPK+'BL'+GOTO 150
        IF(IKEY.EQ.107)NKEY =110+MSPK+'CH'+GOTO 150
        IF(IKEY.EQ.108)NKEY =130+MSPK+'CH'+GOTO 150
        IF(IKEY.EQ.111)NKEY =150+MSPK+'JE'+GOTO 150
        IF(IKEY.EQ.112)NKEY =170+MSPK+'SN'+GOTO 150
        IF(IKEY.EQ.113)NKEY =190+MSPK+'JE'+GOTO 150
        IF(IKEY.EQ.115)NKEY =210+MSPK+'SN'+GOTO 150
        IF(IKEY.EQ.116)NKEY =230+MSPK+'BL'+GOTO 150
        IF(IKEY.GT.318)GOTO 151
        IF(IKEY.GT.300)NKEY = 25+2+(IKEY-301)+GOTO 150
        GOTO 151
150     IF(LETTER.EQ.'B')NKEY = NKEY+10+GOTO 152
        IF(LETTER.EQ.'A')GOTO 152
151     WRITE(5,106)IKEY,LETTER
106     FORMAT(/'******* NO KEY',I4,A1,' ********'//)
        GOTO 107
152     CONTINUE
        IF(IKEY.LT.117)GOTO 700
        WRITE(5,701)
701     FORMAT(//'SPEAKER ?'/'  SS')
        READ(5,702)MSPK
702     FORMAT(A2)
700     WRITE(5,475)IKEY,LETTER,MSPK
        READ(5,476)KEYCHK
        IF(KEYCHK.NE.0)GOTO 107
        WRITE(6,290)MSPK,IKEY,LETTER
290     FORMAT(21X,A2,7X,I3,A1)
        DO 110 IPAGE = 1,4
350     WRITE(5,108)IKEY,LETTER,LIST,IPAGE
108     FORMAT(/'FOR KEY',I4,A1,' LISTENER',I3,' PAGE',I2//
     1  'ENTER RESPONSE BY COLUMNS'//'1 = FIRST WORD  2 = SECOND WORD'//
     1  '  RRRRRRRRRRRRRRRRRRRRRRRRRRR')
        DO 112 I=1,2
112     READ(5,111)(IRESP(I,J),J=1,29)
111     FORMAT(29I1)
        CALL CHECK($350)
        DO 202 I=1,2
        DO 202 J=1,29
202     IRESP(I,J)=IRESP(I,J)-1
        DO 203 ICOL=1,2
        DO 204 IROW =2,29
C       ESTABLISH FEATURE BEING SCORED
        IF(IROW.LE.8)IFEAT=IROW-1
        ITEMP =IROW-1
        IFEAT=MOD(ITEMP,7)
        IF(IFEAT.EQ.0)IFEAT=7
C       ESTABLISH WHICH COLUMN PRESENT STATE OF FEATURE IS IN.
        IPRES=1
        IF(IPAGE.LE.2)IPRES=0
C       FIND KEY ELEMENT
        KEYEL=IROW
        IF(ICOL.EQ.2)KEYEL=IROW+29
        INDEX = 2
```

```
      IF(IPAGE.EQ.1)GOTO 298
      IF(IPAGE.EQ.3)GOTO 298
      IF(KEY(KEYEL,NKEY).NE.IPRES)INDEX=1
      GOTO 299
  298 IF(KEY(KEYEL,NKEY).EQ.IPRES)INDEX=1
C     INDEX =1 IMPLIES MAIN FEATURE PRESENT; 2 IMPLIES ABSENT,
C     SCORE THE RESPONSE
  299 ANSWER = 0.0
      IF(IPAGE.EQ.1)GOTO 295
      IF(IPAGE.EQ.3) GOTO 295
      IF(KEY(KEYEL,NKEY).NE.IRESP(ICOL,IROW))ANSWER=1.0
      GOTO 296
  295 IF(KEY(KEYEL,NKEY).EQ.IRESP(ICOL,IROW))ANSWER=1.0
  296 CONTINUE
      IF(IFEAT.EQ.7)GOTO 257
      ISUBP=2
      NSUBP=2
      IF(IPAGE.EQ.1)ISUBP=1
      IF(IPAGE.EQ.3)ISUBP=1
      IF(KEYSUB(KEYEL,ISUBP).EQ.0)NSUBP=3
      GOTO(251,252,253,254,255,256),IFEAT
  251 VOIC(LIST,INDEX,1)=VOIC(LIST,INDEX,1)+ANSWER
      VOIC(LIST,INDEX,NSUBP)=VOIC(LIST,INDEX,NSUBP)+ANSWER
      PAGE(1,INDEX,1)=PAGE(1,INDEX,1)+ANSWER
      PAGE(1,INDEX,NSUBP) =PAGE(1,INDEX,NSUBP)+ANSWER
      GOTO 260
  252 XNASAL(LIST,INDEX,1)=XNASAL(LIST,INDEX,1)+ANSWER
      XNASAL(LIST,INDEX,NSUBP)=XNASAL(LIST,INDEX,NSUBP)+ANSWER
      PAGE(2,INDEX,1)=PAGE(2,INDEX,1)+ANSWER
      PAGE(2,INDEX,NSUBP)=PAGE(2,INDEX,NSUBP)+ANSWER
      GOTO 260
  253 SUST(LIST,INDEX,1)=SUST(LIST,INDEX,1)+ANSWER
      SUST(LIST,INDEX,NSUBP)=SUST(LIST,INDEX,NSUBP)+ANSWER
      PAGE(3,INDEX,1)=PAGE(3,INDEX,1)+ANSWER
      PAGE(3,INDEX,NSUBP)=PAGE(3,INDEX,NSUBP)+ANSWER
      GOTO 260
  254 SIBIL(LIST,INDEX,1)=SIBIL(LIST,INDEX,1)+ANSWER
      SIBIL(LIST,INDEX,NSUBP)=SIBIL(LIST,INDEX,NSUBP)+ANSWER
      PAGE(4,INDEX,1)=PAGE(4,INDEX,1)+ANSWER
      PAGE(4,INDEX,NSUBP)=PAGE(4,INDEX,NSUBP)+ANSWER
      GOTO 260
  255 GRAV(LIST,INDEX,1)=GRAV(LIST,INDEX,1)+ANSWER
      GRAV(LIST,INDEX,NSUBP)=GRAV(LIST,INDEX,NSUBP)+ANSWER
      PAGE(5,INDEX,1)=PAGE(5,INDEX,1)+ANSWER
      PAGE(5,INDEX,NSUBP)=PAGE(5,INDEX,NSUBP)+ANSWER
      GOTO 260
  256 COMP(LIST,INDEX,1)=COMP(LIST,INDEX,1)+ANSWER
      COMP(LIST,INDEX,NSUBP)=COMP(LIST,INDEX,NSUBP)+ANSWER
      PAGE(6,INDEX,1)=PAGE(6,INDEX,1)+ANSWER
      PAGE(6,INDEX,NSUBP)=PAGE(6,INDEX,NSUBP)+ANSWER
      GOTO 260
  257 EXPER(LIST,INDEX)=EXPER(LIST,INDEX)+ANSWER
      PAGE(7,INDEX,1)=PAGE(7,INDEX,1)+ANSWER
  260 CONTINUE
  204 CONTINUE
  203 CONTINUE
  110 CONTINUE
      DO 611 I=1,7
      DO 611 J=1,2
      DO 611 K=1,3
  611 NPAGE(I,J,K)=IFIX(PAGE(I,J,K)+.5)
      WRITE(7,675)MSPK
  675 FORMAT(A2)
      WRITE(7,612)(((NPAGE(I,J,K),I=1,7),J=1,2),K=1,3)
```

```
612     FORMAT(I3)
201     CONTINUE
        IPASS = 1
270     FORMAT(//5X,'LISTENER',I3,'  SPEAKER',3X,'  KEY',5X,24A1)
        WRITE(6,291)
291     FORMAT(/5X,'NUMBER OF CORRECT RESPONSES'//)
303     WRITE(6,276)
276     FORMAT(10X,'MAIN ATTRIBUTE:',18X,'PRESENT',7X,'ABSENT'//)
        WRITE(6,277)(VOIC(LIST,I,1),I=1,2)
277     FORMAT(15X,'VOICING',28X,F7.2,6X,F7.2)
        WRITE(6,278)(VOIC(LIST,I,2),I=1,2)
278     FORMAT(20X,'FRICTIONAL',13X,F7.2,6X,F7.2)
        WRITE(6,279)(VOIC(LIST,I,3),I=1,2)
279     FORMAT(20X,'NON-FRICTIONAL',9X,F7.2,6X,F7.2/)
        WRITE(6,280)(XNASAL(LIST,I,1),I=1,2)
280     FORMAT(15X,'NASALITY',19X,F7.2,6X,F7.2)
        WRITE(6,281)(XNASAL(LIST,I,2),I=1,2)
281     FORMAT(20X,'GRAVE',18X,F7.2,6X,F7.2)
        WRITE(6,282)(XNASAL(LIST,I,3),I=1,2)
282     FORMAT(20X,'ACUTE',18X,F7.2,6X,F7.2/)
        WRITE(6,283)(SUST(LIST,I,1),I=1,2)
283     FORMAT(15X,'SUSTENTION',17X,F7.2,6X,F7.2)
        WRITE(6,284)(SUST(LIST,I,2),I=1,2)
284     FORMAT(20X,'VOICED',17X,F7.2,6X,F7.2)
        WRITE(6,285)(SUST(LIST,I,3),I=1,2)
285     FORMAT(20X,'UNVOICED',15X,F7.2,6X,F7.2/)
        WRITE(6,286)(SIBIL(LIST,I,1),I=1,2)
286     FORMAT(15X,'SIBILATION',17X,F7.2,6X,F7.2)
        WRITE(6,284)(SIBIL(LIST,I,2),I=1,2)
        WRITE(6,285)(SIBIL(LIST,I,3),I=1,2)
        WRITE(6,287)(GRAV(LIST,I,1),I=1,2)
287     FORMAT(15X,'GRAVENESS',18X,F7.2,6X,F7.2)
        WRITE(6,284)(GRAV(LIST,I,2),I=1,2)
        WRITE(6,285)(GRAV(LIST,I,3),I=1,2)
        WRITE(6,288)(COMP(LIST,I,1),I=1,2)
288     FORMAT(15X,'COMPACTNESS',16X,F7.2,6X,F7.2)
        WRITE(6,284)(COMP(LIST,I,2),I=1,2)
        WRITE(6,285)(COMP(LIST,I,3),I=1,2)
        IF(IPASS.EQ.2)GOTO 304
!       02420,0116000,014
200     CONTINUE
        X=FLOAT(NUMT)
        Y=FLOAT(NUMSUB)
        DO 300 L=1,NUML
        DO 300 I=1,2
        DO 300 J=1,3
        Z=X
        IF(J.GT.1)Z=Y
        W=VOIC(L,I,J)
        VOIL(L,I,J)=CRCT(W,Z)
        W=SUST(L,I,J)
        SUST(L,I,J)=CRCT(W,Z)
        W=GRAV(L,I,J)
        GRAV(L,I,J)=CRCT(W,Z)
        W=COMP(L,I,J)
        COMP(L,I,J)=CRCT(W,Z)
        W=XNASAL(L,I,J)
        XNASAL(L,I,J)=CRCT(W,Z)
        W=SIBIL(L,I,J)
        SIBIL(L,I,J)=CRCT(W,Z)
300     CONTINUE
        IPASS=2
        DO 301 LIST=1,NUML
```

```
!       A242B,8116000,814
        WRITE(6,3001)
        WRITE(6,3000)(ISYSTE(I),I=1,50)
        WRITE(6,302)LIST,(NAME(LIST,J),J=1,24)
302     FORMAT('LISTENER',I3,'  PERCENT CORRECT WITH GUESSING',
     1  ' TRANSFORMATION'/24A1//)
        GOTO 303
304     CONTINUE
301     CONTINUE
        DO 310 I=19,20
        M=1
        IF(I.EQ.20)M=2
        Z=FLOAT(NUML)
        IF(I.EQ.20)Z=1.0
        DO 310 J=1,2
        DO 310 K=1,3
        DO 310 L=1,NUML
        VOIC(I,J,K)=VOIC(I,J,K)+VOIC(L,J,K)**M/Z
        XNASAL(I,J,K)=XNASAL(I,J,K)+XNASAL(L,J,K)**M/Z
        SUST(I,J,K)=SUST(I,J,K)+SUST(L,J,K)**M/Z
        SIBIL(I,J,K)=SIBIL(I,J,K)+SIBIL(L,J,K)**M/Z
        GRAV(I,J,K)=GRAV(I,J,K)+GRAV(L,J,K)**M/Z
        COMP(I,J,K)=COMP(I,J,K)+COMP(L,J,K)**M/Z
310     CONTINUE
        Z=FLOAT(NUML)
        DO 312 J=1,2
        DO 312 K=1,3
        X=VOIC(20,J,K)
        Y=VOIC(19,J,K)
        VOIC(20,J,K)=SE(X,Y,Z)
        X=XNASAL(20,J,K)
        Y=XNASAL(19,J,K)
        XNASAL(20,J,K)=SE(X,Y,Z)
        X=SUST(20,J,K)
        Y=SUST(19,J,K)
        SUST(20,J,K)=SE(X,Y,Z)
        X=SIBIL(20,J,K)
        Y=SIBIL(19,J,K)
        SIBIL(20,J,K)=SE(X,Y,Z)
        X=GRAV(20,J,K)
        Y=GRAV(19,J,K)
        GRAV(20,J,K)=SE(X,Y,Z)
        X=COMP(20,J,K)
        Y=COMP(19,J,K)
        COMP(20,J,K)=SE(X,Y,Z)
312     CONTINUE
        Z=FLOAT(2*NUML)
        DO 313 J=1,3
        DO 313 L=1,NUML
        DO 313 K=1,2
        VOIC(18,1,J)=VOIC(18,1,J)+VOIC(L,K,J)/Z
        XNASAL(18,1,J)=XNASAL(18,1,J)+XNASAL(L,K,J)/Z
        SUST(18,1,J)=SUST(18,1,J)+SUST(L,K,J)/Z
        SIBIL(18,1,J)=SIBIL(18,1,J)+SIBIL(L,K,J)/Z
        GRAV(18,1,J)=GRAV(18,1,J)+GRAV(L,K,J)/Z
        COMP(18,1,J)=COMP(18,1,J)+COMP(L,K,J)/Z
313     CONTINUE
        DO 420 K=1,3
        DO 420 L=1,NUML
        VOIC(18,2,K)=VOIC(18,2,K)+(VOIC(L,1,K)+VOIC(L,2,K))**2/4.
        XNASAL(18,2,K)=XNASAL(18,2,K)+(XNASAL(L,1,K)+XNASAL(L,2,K))**2/4.
        SUST(18,2,K)=SUST(18,2,K)+(SUST(L,1,K)+SUST(L,2,K))**2/4.
        SIBIL(18,2,K)=SIBIL(18,2,K)+(SIBIL(L,1,K)+SIBIL(L,2,K))**2/4.
        GRAV(18,2,K)=GRAV(18,2,K)+(GRAV(L,1,K)+GRAV(L,2,K))**2/4.
```

```
420     COMP(18,2,K)=COMP(18,2,K)+(COMP(L,1,K)+COMP(L,2,K))**2/4.
        Z=FLOAT(NUML)
        DO 311 K=1,3
        X=VOIC(18,2,K)
        Y=VOIC(18,1,K)
        VOIC(18,2,K)=SE(X,Y,Z)
        X=XNASAL(18,2,K)
        Y=XNASAL(18,1,K)
        XNASAL(18,2,K)=SE(X,Y,Z)
        X=SUST(18,2,K)
        Y=SUST(18,1,K)
        SUST(18,2,K)=SE(X,Y,Z)
        X=SIBIL(18,2,K)
        Y=SIBIL(18,1,K)
        SIBIL(18,2,K)=SE(X,Y,Z)
        X=GRAV(18,2,K)
        Y=GRAV(18,1,K)
        GRAV(18,2,K)=SE(X,Y,Z)
        X=COMP(18,2,K)
        Y=COMP(18,1,K)
        COMP(18,2,K)=SE(X,Y,Z)
311     CONTINUE
        DO 316 L=1,NUML
        DO 316 J=1,2
        DO 316 K=1,2
        Z=FLOAT(6*NUML)
        IF(K.EQ.2)Z=1.0
        SUM=VOIC(L,J,1)
        SUM=SUM+XNASAL(L,J,1)
        SUM=SUM+SUST(L,J,1)
        SUM=SUM+SIBIL(L,J,1)
        SUM=SUM+GRAV(L,J,1)
        SUM=SUM+COMP(L,J,1)
        IF(K.EQ.2)SUM=SUM/6.0
        TOT(J,K)=SUM**K/Z +TOT(J,K)
316     CONTINUE
        DO 800 IIII=1,2
        TOT(3,1)=0.0
        TOT(3,2)=0.0
        M2420,0116000,014
        WRITE(6,400)NUML
        WRITE(6,401)(ISYSTE(I),I=1,58)
        WRITE(6,402)NUMS
        WRITE(6,551)
551     FORMAT('LISTENER  MEAN ORT')
        DO 401 L=1,NUML
        SUM=0.0
        DO 502 J=1,2
        SUM = SUM + VOIC(L,J,1)
        SUM = SUM + XNASAL(L,J,1)
        SUM = SUM + SUST(L,J,1)
        SUM = SUM + SIBIL(L,J,1)
        SUM = SUM + GRAV(L,J,1)
        SUM = SUM + COMP(L,J,1)
502     CONTINUE
        XSUM = SUM/12.0
        WRITE(6,550)L,XSUM,(NAME(L,J),J=1,24)
550     FORMAT(I5,F11.2,3X,24A1)
        TOT(3,1) = TOT(3,1) + SUM/FLOAT(NUML)/12.0
        TOT(3,2) =TOT(3,2)+(SUM/12.0)**2
401     CONTINUE
        Z = FLOAT(NUML)
        X=TOT(3,2)
```

```
      Y = TOT(3,1)
      TOT(3,2) = SE(X,Y,Z)
      DO 317 J=1,2
      Z=FLOAT(NUML)
      X=TOT(J,2)
      Y=TOT(J,1)
      TOT(J,2)=SE(X,Y,Z)
317   CONTINUE
400   FORMAT('DRT MEANS AND STANDARD ERRORS FOR',I3,' LISTENERS'/)
401   FORMAT('SYSTEM UNDER TEST=  ',6A1/)
402   FORMAT('NUMBER OF SPEAKERS =',I2/)
      WRITE(6,403)
403   FORMAT(//'MAIN ATTRIBUTE',12X,'PRESENT',10X,'ABSENT',
     1 12X,'TOTAL'/)
      WRITE(6,404)
404   FORMAT(20X,3(4X,'MEAN    S.E. '))
      WRITE(6,405)((VOIC(I,J,1),I=19,20),J=1,2),(VOIC(18,I,1),I=1,2)
405   FORMAT(3X,'VOICING',9X,3(3X,F6.2,2X,F6.2))
      WRITE(6,406)((VOIC(I,J,2),I=19,20),J=1,2),(VOIC(18,I,2),I=1,2)
406   FORMAT(6X,'FRICTIONAL',4X,3(3X,F6.2,2X,F6.2))
      WRITE(6,407)((VOIC(I,J,3),I=19,20),J=1,2),(VOIC(18,I,3),I=1,2)
407   FORMAT(6X,'NON-FRICTIONAL',3(3X,F6.2,2X,F6.2)/)
      WRITE(6,408)((XNASAL(I,J,1),I=19,20),J=1,2),
     1 (XNASAL(18,I,1),I=1,2)
408   FORMAT(3X,'NASALITY',8X,3(3X,F6.2,2X,F6.2))
      WRITE(6,409)((XNASAL(I,J,2),I=19,20),J=1,2),
     1 (XNASAL(18,I,2),I=1,2)
409   FORMAT(6X,'GRAVE',9X,3(3X,F6.2,2X,F6.2))
      WRITE(6,410)((XNASAL(I,J,3),I=19,20),J=1,2),
     1 (XNASAL(18,I,3),I=1,2)
410   FORMAT(6X,'ACUTE',9X,3(3X,F6.2,2X,F6.2)/)
      WRITE(6,411)((SUST(I,J,1),I=19,20),J=1,2),(SUST(18,I,1),I=1,2)
411   FORMAT(3X,'SUSTENTION',6X,3(3X,F6.2,2X,F6.2))
      WRITE(6,412)((SUST(I,J,2),I=19,20),J=1,2),(SUST(18,I,2),I=1,2)
412   FORMAT(6X,'VOICED',8X,3(3X,F6.2,2X,F6.2))
      WRITE(6,413)((SUST(I,J,3),I=19,20),J=1,2),(SUST(18,I,3),I=1,2)
413   FORMAT(6X,'UNVOICED',6X,3(3X,F6.2,2X,F6.2)/)
      WRITE(6,414)((SIBIL(I,J,1),I=19,20),J=1,2),(SIBIL(18,I,1),I=1,2)
414   FORMAT(3X,'SIBILATION',6X,3(3X,F6.2,2X,F6.2))
      WRITE(6,412)((SIBIL(I,J,2),I=19,20),J=1,2),(SIBIL(18,I,2),I=1,2)
      WRITE(6,413)((SIBIL(I,J,3),I=19,20),J=1,2),(SIBIL(18,I,3),I=1,2)
      WRITE(6,415)((GRAV(I,J,1),I=19,20),J=1,2),(GRAV(18,I,1),I=1,2)
415   FORMAT(3X,'GRAVENESS',7X,3(3X,F6.2,2X,F6.2))
      WRITE(6,412)((GRAV(I,J,2),I=19,20),J=1,2),(GRAV(18,I,2),I=1,2)
      WRITE(6,413)((GRAV(I,J,3),I=19,20),J=1,2),(GRAV(18,I,3),I=1,2)
      WRITE(6,416)((COMP(I,J,1),I=19,20),J=1,2),(COMP(18,I,1),I=1,2)
416   FORMAT(3X,'COMPACTNESS',6X,3(3X,F6.2,2X,F6.2))
      WRITE(6,412)((COMP(I,J,2),I=19,20),J=1,2),(COMP(18,I,2),I=1,2)
      WRITE(6,413)((COMP(I,J,3),I=19,20),J=1,2),(COMP(18,I,3),I=1,2)
      WRITE(6,417)((TOT(I,J),J=1,2),I=1,3)
417   FORMAT(3X,'TOTALS',10X,3(3X,F6.2,2X,F6.2))
      WRITE(6,490)(TOT(3,J),J=1,2)
490   FORMAT(/30X,'******************'/
     1 30X,'* MEAN = ',F6.2,' *'/
     1 13X,'TOTAL DRT SCORE= *',10X,'*'/
     1 30X,'* S.E. = ',F6.2,' *'/
     1 30X,'******************')
      NUMTOT = 192*NUML*NUMS
      WRITE(6,555)NUMTOT
555   FORMAT(/10X'TOTAL NUMBER OF TEST ITEMS =',I7)
600   CONTINUE
      STOP
      END
C
```

```
C
C
C
C
C
      SUBROUTINE CHECK(IOVER)
C
C
C     THIS SUBROUTINE CHECKS FOR CORRECT ENTRY OF DATA
C
C
      DIMENSION LINE(31)
      COMMON IRESP(2,29)
 31   IPASS =1
      N=1
      M=15
 20   IF(IPASS.EQ.2)N=16M=29
     1 024d0,0116000,014
      WRITE(5,21)
 21   FORMAT(18X,'1',16X,'2'/)
      DO 1 I=N,M
      DO 3 II = 1,31
 3    LINE(II) = ' '
      IF(IRESP(1,I).EQ.2)GOTO 4
      L=5
      IF(IRESP(1,I).NE.1)L=13
      DO 2 J=1,L
 2    LINE(J) = 'X'
      GOTO 5
 4    CONTINUE
      DO 6 J = 9,13
 6    LINE(J) = 'X'
 5    CONTINUE
      IF(IRESP(2,I).EQ.2)GOTO 8
      L=23
      IF(IRESP(2,I).NE.1)L=31
      DO 7 J=19,L
 7    LINE(J) = 'X'
      GOTO 9
 8    CONTINUE
      DO 10 J=27,31
 10   LINE(J) = 'X'
 9    CONTINUE
      WRITE(5,11)I,(LINE(J),J=1,31)
 11   FORMAT(5X,I2,5X,31A1)
 1    CONTINUE
      WRITE(5,12)
 12   FORMAT(/'IF OK ENTER 0')
      READ(5,13)IANS
 13   FORMAT(I1)
      IF(IANS.EQ.0)GOTO 14
 30   WRITE(5,15)
 15   FORMAT(/'ROW AND COLUMN TO CHANGE?   ENTER 999 TO CHANGE ENTIRE',
     1 ' PAGE'/'  RRC')
      READ(5,16)IROW,ICOL
      IF(IROW.EQ.99)RETURN IOVER
      IF(IROW.GT.29)GOTO 30
      IF(IROW.LT.1)GOTO 30
      IF(ICOL.GT.2)GOTO 30
      IF(ICOL.LT.1)GOTO 30
 16   FORMAT(I2,I1)
      WRITE(5,17)
 17   FORMAT(/'NEW ENTRY?'/'  R')
      READ(5,13)IRESP(ICOL,IROW)
```

```
      IF(IROW.LE.15)GOTO 31
      GOTO 20
14    IF(IPASS .EQ.2)RETURN
      IPASS = 2
      GOTO 20
      END
```

```
C
C
C                                                          10 FEB 76
C
C       DIAGNOSTIC RHYME TEST SCORING W/CARTRIDGE INPUT
C
C       CSP-30 IMPLEMENTATION
C
C       FOR INFORMATION CONCERNING THIS PROGRAM CONTACT:
C
C                       CAPTAIN STEVEN MEISTER
C                       ESD/MCE
C                       HANSCOM AFB, MA 01731
C
C                       TELEPHONE:
C                           COMM, (617) 861-4433
C                           AUTOVON     478-4433
C
C
C
C
      COMMON ARRAY(60),ISYS(50),NAME(11,24),NPAGE(7,2,3),
     1 DATA(11,7,36),MSPK(11,6)
      DIMENSION SEND(6)
      WRITE(5,50)
 50   FORMAT(////20X,'DRT CARTRIDGE DATA CHECKOUT'//
     1 'INSERT CARTRIDGE IN UPPER DECK '//
     1 'I/O RESET - CONTINUE'/)
      PAUSE
      READ(7,75)(ISYS(I),I=1,50),NUML,NUMS
 75   FORMAT(50A1,2I3)
 1    FORMAT(50A1//'NUMBER LISTENERS =',I3/'NUMBER SPEAKERS  =',I3//)
!     02420,01160000,014
      DO 2 LIST = 1,NUML
      READ(7,3)(NAME(LIST,I),I=1,24)
 3    FORMAT(24A1)
      DO 4 ISPK = 1,NUMS
      WRITE(6,500)
 500  FORMAT('     ')
      WRITE(6,1)(ISYS(I),I=1,50),NUML,NUMS
      READ(7,30)MSPK(LIST,ISPK)
 30   FORMAT(A2)
      READ(7,5)(((NPAGE(I,J,K),I=1,7),J=1,2),K=1,3)
 5    FORMAT(I3)
      WRITE(6,40)(NAME(LIST,I),I=1,24),MSPK(LIST,ISPK)
 40   FORMAT(9X,28('*'),10X,6('*'),/
     1 'LISTENER: ',24A1,'  * SPEAKER: *',1X,A2,' *'/
     1 9X,28('*'),10X,6('*'),//
     1 'NUMBER OF INCORRECT RESPONSES:'//)
      DO 20 I=1,6
      DO 22 K=1,3
      DO 41 J=1,2
      L = 6*I+J+2*K-8
      NTOT = 16
      IF(K.NE.1)NTOT=8
 61   TOT = FLOAT(NTOT)
      DATA(LIST,ISPK,L)=(2.0*FLOAT(NPAGE(I,J,K))-TOT)*100./TOT
      NPAGE(I,J,K) = NTOT-NPAGE(I,J,K)
 41   CONTINUE
 22   CONTINUE
 20   CONTINUE
      WRITE(6,276)
      WRITE(6,277)(NPAGE(1,J,1),J=1,2)
      WRITE(6,278)(NPAGE(1,J,2),J=1,2)
```

```
      WRITE(6,279)(NPAGE(1,J,3),J=1,2)
      WRITE(6,280)(NPAGE(2,J,1),J=1,2)
      WRITE(6,281)(NPAGE(2,J,2),J=1,2)
      WRITE(6,282)(NPAGE(2,J,3),J=1,2)
      WRITE(6,283)(NPAGE(3,J,1),J=1,2)
      WRITE(6,284)(NPAGE(3,J,2),J=1,2)
      WRITE(6,285)(NPAGE(3,J,3),J=1,2)
      WRITE(6,286)(NPAGE(4,J,1),J=1,2)
      WRITE(6,284)(NPAGE(4,J,2),J=1,2)
      WRITE(6,285)(NPAGE(4,J,3),J=1,2)
      WRITE(6,287)(NPAGE(5,J,1),J=1,2)
      WRITE(6,284)(NPAGE(5,J,2),J=1,2)
      WRITE(6,285)(NPAGE(5,J,3),J=1,2)
      WRITE(6,288)(NPAGE(6,J,1),J=1,2)
      WRITE(6,284)(NPAGE(6,J,2),J=1,2)
      WRITE(6,285)(NPAGE(6,J,3),J=1,2)
!     02420,0116800,014
 21   FORMAT(10X,I5,5X,I5)
 4    CONTINUE
 2    CONTINUE
      DO 200 LIST=1,NUML
!     02420,0116800,014
      WRITE(6,500)
      WRITE(6,1)(ISYS(I),I=1,50),NUML,NUMS
      WRITE(6,201)(NAME(LIST,I),I=1,24)
 201  FORMAT(13X,27('*')/'FOR LISTENER: ',24A1,' *'/
     1 13X,27('*')//
     1 'SPKR  SCORE'/)
      DO 204 ISPKR=1,NUMS
      SUM = 0.0
      DO 202 I=1,31,6
      J=I+1
 202  SUM = SUM + DATA(LIST,ISPKR,I) * DATA(LIST,ISPKR,J)
      SUM = SUM/12.0
      WRITE(6,203)MSPK(LIST,ISPKR),SUM
 203  FORMAT(1X,A2,1X,F7.2)
 204  CONTINUE
      WRITE(6,403)
      WRITE(6,404)
      DO 209 I=1,6
 209  SEND(I)=0.0
      DO 210 I=1,35,2
      J=I+1
      DO 211 K=1,NUMS
 211  ARRAY(K)=DATA(LIST,K,I)
      CALL STATS(NUMS,X,S)
      SEND(1)=X
      SEND(2)=S
      DO 212 K=1,NUMS
 212  ARRAY(K)=DATA(LIST,K,J)
      CALL STATS(NUMS,X,S)
      SEND(3) = X
      SEND(4) = S
      DO 213 K=1,NUMS
 213  ARRAY(K)=(ARRAY(K)+DATA(LIST,K,I))/2.0
      CALL STATS(NUMS,X,S)
      SEND(5)=X
      SEND(6)=S
      CALL OUT(I,SEND)
 210  CONTINUE
      DO 215 K=1,NUMS
      SUM = 0.0
      DO 214 I=1,31,6
 214  SUM = SUM + DATA(LIST,K,I)
```

```
215     ARRAY(K) = SUM/6.0
        CALL STATS(NUMS,X,S)
        SEND(1)=X
        SEND(2)=S
        DO 216 K=1,NUMS
        SUM = 0.0
        DO 217 I=2,32,6
217     SUM = SUM + DATA(LIST,K,I)
216     ARRAY(K) = SUM/6.0
        CALL STATS(NUMS,X,S)
        SEND(3) = X
        SEND(4) = S
        DO 219 K=1,NUMS
        SUM = 0.0
        DO 218 I=1,31,6
        J = I+1
218     SUM = SUM + DATA(LIST,K,I) + DATA(LIST,K,J)
219     ARRAY(K) = SUM/12.0
        CALL STATS(NUMS,X,S)
        SEND(5) = X
        SEND(6) = S
        CALL OUT(36,SEND)
        WRITE(6,490)X,S
200     CONTINUE
        DO 300 ISPKR = 1,NUMS
        02420,0116000,014
        WRITE(6,500)
        WRITE(6,1)(ISYS(I),I=1,50),NUML,NUMS
        WRITE(6,301)MSPK(1,ISPKR)
301     FORMAT(12X,'*****'/'FOR SPEAKER: ',A2,' *'/
    1   12X,'*****'//'LISTENER',18X,'SCORE'/)
        DO 304 LIST = 1,NUML
        SUM = 0.0
        DO 302 I=1,31,6
        J=I+1
302     SUM = SUM+DATA(LIST,ISPKR,I)+DATA(LIST,ISPKR,J)
        SUM = SUM/12.0
        WRITE(6,303)(NAME(LIST,L),L=1,24),SUM
303     FORMAT(24A1,F7.2)
304     CONTINUE
        WRITE(6,403)
        WRITE(6,404)
        DO 310 I=1,35,2
        J=I+1
        DO 311 K=1,NUML
311     ARRAY(K)=DATA(K,ISPKR,I)
        CALL STATS(NUML,X,S)
        SEND(1)=X
        SEND(2)=S
        DO 312 K=1,NUML
312     ARRAY(K)=DATA(K,ISPKR,J)
        CALL STATS(NUML,X,S)
        SEND(3)=X
        SEND(4)=S
        DO 313 K=1,NUML
313     ARRAY(K) = (ARRAY(K)+DATA(K,ISPKR,I))/2.0
        CALL STATS(NUML,X,S)
        SEND(5)=X
        SEND(6)=S
        CALL OUT(1,SEND)
310     CONTINUE
        DO 315 K=1,NUML
        SUM = 0.0
        DO 314 I=1,31,6
```

```
 314     SUM = SUM + DATA(K,ISPKR,I)
 315     ARRAY(K) = SUM/6.0
         CALL STATS(NUML,X,S)
         SEND(1)=X
         SEND(2)=S
         DO 316 K=1,NUML
         SUM = 0.0
         DO 317 I=2,32,6
 317     SUM = SUM+DATA(K,ISPKR,I)
 316     ARRAY(K)=SUM/6.0
         CALL STATS(NUML,X,S)
         SEND(3)=X
         SEND(4)=S
         DO 319 K=1,NUML
         SUM =0.0
         DO 318 I=1,31,6
         J=I+1
 318     SUM = SUM+DATA(K,ISPKR,I)+DATA(K,ISPKR,J)
 319     ARRAY(K)=SUM/12.0
         CALL STATS(NUML,X,S)
         SEND(5)=X
         SEND(6)=S
         CALL OUT(36,SEND)
         WRITE(6,490)X,S
 300     CONTINUE
!        02420,#116000,014
         WRITE(6,500)
         WRITE(6,1)(ISYS(I),I=1,50),NUML,NUMS
         WRITE(6,320)
 320     FORMAT('COMBINED RESULTS - STANDARD ERRORS ACROSS ',
     1   'SPEAKERS AND LISTENERS ******'//)
         WRITE(6,403)
         WRITE(6,404)
         NUMT = NUML*NUMS
         DO 321 I=1,35,2
         J=I+1
         DO 322 K=1,NUML
         DO 322 L =1,NUMS
         M=NUMS*(K-1)+L
 322     ARRAY(M)=DATA(K,L,I)
         CALL STATS(NUMT,X,S)
         SEND(1)=X
         SEND(2)=S
         DO 323 K=1,NUML
         DO 323 L=1,NUMS
         M=NUMS*(K-1)+L
 323     ARRAY(M)=DATA(K,L,J)
         CALL STATS(NUMT,X,S)
         SEND(3)=X
         SEND(4)=S
         DO 324 K=1,NUML
         DO 324 L=1,NUMS
         M=NUMS*(K-1)+L
         SUM = DATA(K,L,I)+DATA(K,L,J)
 324     ARRAY(M)=SUM/2.0
         CALL STATS(NUMT,X,S)
         SEND(5)=X
         SEND(6)=S
         CALL OUT(I,SEND)
 321     CONTINUE
         DO 325 K=1,NUML
         DO 325 L=1,NUMS
         M=NUMS*(K-1)+L
```

```
      SUM = 0.0
      DO 326 I=1,31,6
326   SUM = SUM+DATA(K,L,I)
325   ARRAY(M)=SUM/6.0
      CALL STATS(NUMT,X,S)
      SEND(1)=X
      SEND(2)=S
      DO 327 K=1,NUML
      DO 327 L=1,NUMS
      M=NUMS*(K-1)+L
      SUM=0.0
      DO 328 I=2,32,6
328   SUM = SUM + DATA(K,L,I)
327   ARRAY(M)=SUM/6.0
      CALL STATS(NUMT,X,S)
      SEND(3)=X
      SEND(4)=S
      DO 330 K=1,NUML
      DO 330 L=1,NUMS
      M=NUMS*(K-1)+L
      SUM=0.0
      DO 331 I=1,31,6
      J=I+1
331   SUM = SUM+DATA(K,L,I)+DATA(K,L,J)
330   ARRAY(M)=SUM/12.0
      CALL STATS(NUMT,X,S)
      SEND(5)=X
      SEND(6)=S
      CALL OUT(36,SEND)
      WRITE(6,490)X,S
      02420,0116000,014
      WRITE(6,500)
      WRITE(6,1)(ISYS(I),I=1,50),NUML,NUMS
      DO 70 I=1,NUML
      DO 70 J=1,NUMS
      WRITE(6,71)(DATA(I,J,K),K=1,36)
71    FORMAT(/(6(2X,F10.2)))
70    CONTINUE
      STOP
276   FORMAT(10X,'MAIN ATTRIBUTE!',18X,'PRESENT',7X,'ABSENT!//)
277   FORMAT(15X,'VOICING',23X,I2,11X,I2)
278   FORMAT(20X,'FRICTIONAL',16X,I2,11X,I2)
279   FORMAT(20X,'NON-FRICTIONAL',12X,I2,11X,I2/)
280   FORMAT(15X,'NASALITY',22X,I2,11X,I2)
281   FORMAT(20X,'GRAVE',21X,I2,11X,I2)
282   FORMAT(20X,'ACUTE',21X,I2,11X,I2/)
283   FORMAT(15X,'SUSTENTION',20X,I2,11X,I2)
284   FORMAT(20X,'VOICED',20X,I2,11X,I2)
285   FORMAT(20X,'UNVOICED',18X,I2,11X,I2/)
286   FORMAT(15X,'SIBILATION',20X,I2,11X,I2)
287   FORMAT(15X,'GRAVENESS',21X,I2,11X,I2)
288   FORMAT(15X,'COMPACTNESS',19X,I2,11X,I2)
400   FORMAT('DRT MEANS AND STANDARD ERRORS FOR',I3,' LISTENERS'/)
401   FORMAT('SYSTEM UNDER TEST:  ',50A1/)
402   FORMAT('NUMBER OF SPEAKERS =',I2/)
403   FORMAT(//'MAIN ATTRIBUTE!',12X,'PRESENT',10X,'ABSENT',
     1  12X,'TOTAL'/)
404   FORMAT(20X,3(4X,'MEAN    S.E. '))
490   FORMAT(/30X,'*****************'/
     1  30X,'* MEAN = ',F6.2,' *'/
     1  13X,'TOTAL DRT SCORE: *',15X,'*'/
     1  30X,'* S.E. = ',F6.2,' *'/
     1  30X,'*****************')
      END
```

```
C
C
C
C
C
      SUBROUTINE STATS(N,XMEAN,STDERR)
C
C
C
      COMMON ARRAY(60)
      X=0.0
      XN = FLOAT(N)
      DO 1 I=1,N
      X = X + ARRAY(I)
    1 CONTINUE
      XMEAN = X/XN
      STDERR = 0.0
      DO 2 I=1,N
    2 STDERR = STDERR + (ARRAY(I)-XMEAN)*(ARRAY(I)-XMEAN)
      STDERR = SQRT(STDERR/XN/XN)
      RETURN
      END
C
C
C
C
C
C
C
      SUBROUTINE OUT(N,X)
      DIMENSION X(6)
      IF(N.EQ.36)GOTO 19
      K=(N+1)/2
      IF(K.EQ.11)K=8
      IF(K.EQ.14)K=8
      IF(K.EQ.17)K=8
      IF(K.EQ.12)K=9
      IF(K.EQ.15)K=9
      IF(K.EQ.18)K=9
      IF(K.EQ.13)K=11
      IF(K.EQ.16)K=12
      GOTO(1,2,3,4,5,6,7,8,9,10,13,16),K
    1 WRITE(6,405)(X(I),I=1,6)
      RETURN
    2 WRITE(6,406)(X(I),I=1,6)
      RETURN
    3 WRITE(6,407)(X(I),I=1,6)
      RETURN
    4 WRITE(6,408)(X(I),I=1,6)
      RETURN
    5 WRITE(6,409)(X(I),I=1,6)
      RETURN
    6 WRITE(6,410)(X(I),I=1,6)
      RETURN
    7 WRITE(6,411)(X(I),I=1,6)
      RETURN
    8 WRITE(6,412)(X(I),I=1,6)
      RETURN
    9 WRITE(6,413)(X(I),I=1,6)
      RETURN
   10 WRITE(6,414)(X(I),I=1,6)
      RETURN
   13 WRITE(6,415)(X(I),I=1,6)
```

```
      RETURN
18    WRITE(6,416)(X(I),I=1,6)
      RETURN
19    WRITE(6,417)(X(I),I=1,6)
      RETURN
405   FORMAT(3X,'VOICING',9X,3(3X,F6.2,2X,F6.2))
406   FORMAT(6X,'FRICTIONAL',4X,3(3X,F6.2,2X,F6.2))
407   FORMAT(6X,'NON-FRICTIONAL',3(3X,F6.2,2X,F6.2)/)
408   FORMAT(3X,'NASALITY',8X,3(3X,F6.2,2X,F6.2))
409   FORMAT(6X,'GRAVE',9X,3(3X,F6.2,2X,F6.2))
410   FORMAT(6X,'ACUTE',9X,3(3X,F6.2,2X,F6.2)/)
411   FORMAT(3X,'SUSTENTION',6X,3(3   F6.2,2X,F6.2))
412   FORMAT(6X,'VOICED',8X,3(3X,F6.2,2X,F6.2))
413   FORMAT(6X,'UNVOICED',6X,3(3X,F6.2,2X,F6.2)/)
414   FORMAT(3X,'SIBILATION',6X,3(3X,F6.2,2X,F6.2))
415   FORMAT(3X,'GRAVENESS',7X,3(3X,F6.2,2X,F6.2))
416   FORMAT(3X,'COMPACTNESS',5X,3(3X,F6.2,2X,F6.2))
417   FORMAT(3X,'TOTALS',10X,3(3X,F6.2,2X,F6.2))
      END
```

DIAGNOSTIC RHYME TEST

LISTENER SUMMARIES:

SAMPLE TEST RUN

LISTENER 1 SPEAKER KEY DOE, JOHN
BV 1028
JE 113A

NUMBER OF CORRECT RESPONSES:

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	32,00	29,00
FRICTIONAL	16,00	13,00
NON-FRICTIONAL	16,00	16,00
NASALITY	31,00	30,00
GRAVE	16,00	15,00
ACUTE	15,00	15,00
SUSTENTION	24,00	25,00
VOICED	13,00	11,00
UNVOICED	11,00	14,00
SIBILATION	31,00	31,00
VOICED	15,00	16,00
UNVOICED	16,00	15,00
GRAVENESS	25,00	29,00
VOICED	15,00	16,00
UNVOICED	09,99	13,00
COMPACTNESS	32,00	29,00
VOICED	16,00	14,00
UNVOICED	16,00	15,00

SAMPLE TEST RUN

LISTENER & SPEAKER KEY JONES, ROBERT
BV 102B
JE 113A

NUMBER OF CORRECT RESPONSES:

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	32,00	30,00
FRICTIONAL	16,00	16,00
NON-FRICTIONAL	16,00	14,00
NASALITY	32,00	31,00
GRAVE	16,00	15,00
ACUTE	16,00	16,00
SUSTENTION	25,00	26,00
VOICED	11,00	12,00
UNVOICED	14,00	14,00
SIBILATION	26,00	32,00
VOICED	14,00	16,00
UNVOICED	14,00	16,00
GRAVENESS	31,00	29,00
VOICED	16,00	16,00
UNVOICED	15,00	13,00
COMPACTNESS	32,00	32,00
VOICED	16,00	16,00
UNVOICED	16,00	16,00

SAMPLE TEST RUN
LISTENER 1 PERCENT CORRECT WITH GUESSING TRANSFORMATION
DUE, JOHN

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	099,99	81,25
FRICTIONAL	099,99	62,50
NON-FRICTIONAL	099,99	099,99
NASALITY	93,75	87,50
GRAVE	099,99	87,50
ACUTE	87,50	87,50
SUSTENTION	50,00	56,25
VOICED	62,50	37,50
UNVOICED	37,50	75,00
SIBILATION	93,75	93,75
VOICED	87,50	099,99
UNVOICED	099,99	87,50
GRAVENESS	56,25	81,25
VOICED	87,50	099,99
UNVOICED	25,00	62,50
COMPACTNESS	099,99	81,25
VOICED	099,99	75,00
UNVOICED	099,99	87,50

SAMPLE TEST RUN
LISTENER 2 PERCENT CORRECT WITH GUESSING TRANSFORMATION
JONES, ROBERT

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	999,99	87,50
FRICTIONAL	999,99	999,99
NON-FRICTIONAL	999,99	75,00
NASALITY	999,99	93,75
GRAVE	999,99	87,50
ACUTE	999,99	999,99
SUSTENTION	56,25	62,50
VOICED	37,50	50,00
UNVOICED	75,00	75,00
SIBILATION	75,00	999,99
VOICED	75,00	999,99
UNVOICED	75,00	999,99
GRAVENESS	93,75	81,25
VOICED	999,99	999,99
UNVOICED	87,50	62,50
COMPACTNESS	999,99	999,99
VOICED	999,99	999,99
UNVOICED	999,99	999,99

DRT MEANS AND STANDARD ERRORS FOR 2 LISTENERS

SYSTEM UNDER TEST: SAMPLE TEST RUN

NUMBER OF SPEAKERS = 2

LISTENER	MEAN DRT	
1	81,25	DOE, JOHN
2	87,50	JONES, ROBERT

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	999,99	0,00	84,37	2,21	92,19	1,10
FRICTIONAL	999,99	0,00	81,25	13,26	90,62	6,63
NON-FRICTIONAL	999,99	0,00	87,50	8,84	93,75	4,42
NASALITY	96,87	2,21	90,62	2,21	93,75	2,21
GRAVE	999,99	0,00	87,50	0,00	93,75	0,00
ACUTE	93,75	4,42	93,75	4,42	93,75	4,42
SUSTENTION	53,12	2,21	59,37	2,21	56,25	2,21
VOICED	50,00	8,84	43,75	4,42	46,87	2,21
UNVOICED	56,25	13,26	75,00	0,00	65,62	6,63
SIBILATION	84,37	6,63	96,87	2,21	90,62	2,21
VOICED	81,25	4,42	999,99	0,00	90,62	2,21
UNVOICED	87,50	8,84	93,75	4,42	90,62	2,21
GRAVENESS	75,00	13,26	81,25	0,00	78,12	6,63
VOICED	93,75	4,42	999,99	0,00	96,87	2,21
UNVOICED	56,25	22,10	62,50	0,00	59,37	11,05
COMPACTNESS	999,99	0,00	90,62	6,63	95,31	3,31
VOICED	999,99	0,00	87,50	8,84	93,75	4,42
UNVOICED	999,99	0,00	93,75	4,42	96,87	2,21
TOTALS	84,90	1,84	83,85	2,58	84,37	2,21

TOTAL DRT SCORE:

MEAN	84,37
S.E.	2,21

TOTAL NUMBER OF TEST ITEMS = 768

DRT MEANS AND STANDARD ERRORS FOR 2 LISTENERS

SYSTEM UNDER TEST: SAMPLE TEST RUN

NUMBER OF SPEAKERS = 2

LISTENER	MEAN DRT	
1	81,25	DOE, JOHN
2	87,50	JONES, ROBERT

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	999,99	0,00	84,37	2,21	92,19	1,10
FRICTIONAL	999,99	0,00	81,25	13,26	90,62	6,63
NON-FRICTIONAL	999,99	0,00	87,50	8,84	93,75	4,42
NASALITY	96,87	2,21	90,62	2,21	93,75	2,21
GRAVE	999,99	0,00	87,50	0,00	93,75	0,00
ACUTE	93,75	4,42	93,75	4,42	93,75	4,42
SUSTENTION	53,12	2,21	59,37	2,21	56,25	2,21
VOICED	50,00	8,84	43,75	4,42	46,87	2,21
UNVOICED	56,25	13,26	75,00	0,00	65,62	6,63
SIBILATION	84,37	6,63	96,87	2,21	90,62	2,21
VOICED	81,25	4,42	999,99	0,00	90,62	2,21
UNVOICED	87,50	8,84	93,75	4,42	90,62	2,21
GRAVENESS	75,00	13,26	81,25	0,00	78,12	6,63
VOICED	93,75	4,42	999,99	0,00	96,87	2,21
UNVOICED	56,25	22,10	62,50	0,00	59,37	11,05
COMPACTNESS	999,99	0,00	90,62	6,63	95,31	3,31
VOICED	999,99	0,00	87,50	8,84	93,75	4,42
UNVOICED	999,99	0,00	93,75	4,42	96,87	2,21
TOTALS	84,90	0,00	83,85	0,00	84,37	2,21

TOTAL DRT SCORE:

MEAN =	84,37
S.E. =	2,21

TOTAL NUMBER OF TEST ITEMS = 768

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

LISTENER: DOE, JOHN	SPEAKER: BV

NUMBER OF INCORRECT RESPONSES:

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	0	2
FRICTIONAL	0	2
NON-FRICTIONAL	0	0
NASALITY	1	2
GRAVE	0	1
ACUTE	1	1
SUSTENTION	5	3
VOICED	2	1
UNVOICED	3	2
SIBILATION	1	1
VOICED	1	0
UNVOICED	0	1
GRAVENESS	4	2
VOICED	1	0
UNVOICED	3	2
COMPACTNESS	0	3
VOICED	0	2
UNVOICED	0	1

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

LISTENER: DOE, JOHN * SPEAKER: * JE *

NUMBER OF INCORRECT RESPONSES:

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	0	1
FRICTIONAL	0	1
NON-FRICTIONAL	0	0
NASALITY	0	6
GRAVE	0	0
ACUTE	0	0
SUSTENTION	3	4
VOICED	1	4
UNVOICED	2	0
SIBILATION	0	0
VOICED	0	0
UNVOICED	0	0
GRAVENESS	3	1
VOICED	0	0
UNVOICED	3	1
COMPACTNESS	0	0
VOICED	0	0
UNVOICED	0	0

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

LISTENER: JONES, ROBERT	SPEAKER: BV

NUMBER OF INCORRECT RESPONSES:

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	0	0
FRICTIONAL	0	0
NON-FRICTIONAL	0	0
NASALITY	0	0
GRAVE	0	0
ACUTE	0	0
SUSTENTION	3	4
VOICED	3	2
UNVOICED	0	2
SIBILATION	2	0
VOICED	2	0
UNVOICED	0	0
GRAVENESS	0	2
VOICED	0	0
UNVOICED	0	2
COMPACTNESS	0	0
VOICED	0	0
UNVOICED	0	0

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

LISTENER: JONES, ROBERT
SPEAKER: JE

NUMBER OF INCORRECT RESPONSES:

MAIN ATTRIBUTE:	PRESENT	ABSENT
VOICING	0	2
FRICTIONAL	0	0
NON-FRICTIONAL	0	2
NASALITY	0	1
GRAVE	0	1
ACUTE	0	0
SUSTENTION	4	2
VOICED	2	2
UNVOICED	2	0
SIBILATION	2	0
VOICED	0	0
UNVOICED	2	0
GRAVENESS	1	1
VOICED	0	0
UNVOICED	1	1
COMPACTNESS	0	0
VOICED	0	0
UNVOICED	0	0

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

FOR LISTENER: DOE, JOHN

SPKR SCORE

BV 75,00
JE 87,50

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	999,99	0,00	81,25	4,42	90,62	2,21
FRICTIONAL	999,99	0,00	62,50	8,84	81,25	4,42
NON-FRICTIONAL	999,99	0,00	999,99	0,00	999,99	0,00
NASALITY	93,75	4,42	87,50	8,84	90,62	6,63
GRAVE	999,99	0,00	87,50	8,84	93,75	4,42
ACUTE	87,50	8,84	87,50	8,84	87,50	8,84
SUSTENTION	50,00	8,84	56,25	4,42	53,12	2,21
VOICED	62,50	8,84	37,50	26,52	50,00	8,84
UNVOICED	37,50	8,84	75,00	17,68	56,25	13,26
SIBILATION	93,75	4,42	93,75	4,42	93,75	4,42
VOICED	87,50	8,84	999,99	0,00	93,75	4,42
UNVOICED	999,99	0,00	87,50	8,84	93,75	4,42
GRAVENESS	56,25	4,42	81,25	4,42	68,75	4,42
VOICED	87,50	8,84	999,99	0,00	93,75	4,42
UNVOICED	25,00	0,00	62,50	8,84	43,75	4,42
COMPACTNESS	999,99	0,00	81,25	13,26	90,62	6,63
VOICED	999,99	0,00	75,00	17,68	87,50	8,84
UNVOICED	999,99	0,00	87,50	8,84	93,75	4,42
TOTALS	82,29	3,68	80,21	5,16	81,25	4,42

TOTAL DRT SCORE:

MEAN	81,25
S.E.	4,42

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

FOR LISTENER: JONES, ROBERT

SPKR	SCORE
BV	88,54
JE	86,46

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	999,99	0,00	87,50	8,84	93,75	4,42
FRICTIONAL	999,99	0,00	999,99	0,00	999,99	0,00
NON-FRICTIONAL	999,99	0,00	75,00	17,68	87,50	8,84
NASALITY	999,99	0,00	93,75	4,42	96,87	2,21
GRAVE	999,99	0,00	87,50	8,84	93,75	4,42
ACUTE	999,99	0,00	999,99	0,00	999,99	0,00
SUSTENTION	56,25	4,42	62,50	8,84	59,37	2,21
VOICED	37,50	8,84	50,00	0,00	43,75	4,42
UNVOICED	75,00	17,68	75,00	17,68	75,00	0,00
SIBILATION	75,00	0,00	999,99	0,00	87,50	0,00
VOICED	75,00	17,68	999,99	0,00	87,50	8,84
UNVOICED	75,00	17,68	999,99	0,00	87,50	8,84
GRAVENESS	93,75	4,42	81,25	4,42	87,50	0,00
VOICED	999,99	0,00	999,99	0,00	999,99	0,00
UNVOICED	87,50	8,84	62,50	8,84	75,00	0,00
COMPACTNESS	999,99	0,00	999,99	0,00	999,99	0,00
VOICED	999,99	0,00	999,99	0,00	999,99	0,00
UNVOICED	999,99	0,00	999,99	0,00	999,99	0,00
TOTALS	87,50	1,47	87,50	0,00	87,50	0,74

TOTAL DRI SCORE:	MEAN =	87,50
	S.E. =	0,74

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

FOR SPEAKER: BV

LISTENER	SCORE
DOE, JOHN	75,00
JONES, ROBERT	88,54

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	999,99	0,00	87,50	8,84	93,75	4,42
FRICTIONAL	999,99	0,00	75,00	17,68	87,50	8,84
NON-FRICTIONAL	999,99	0,00	999,99	0,00	999,99	0,00
NASALITY	93,75	4,42	87,50	8,84	90,62	6,63
GRAVE	999,99	0,00	87,50	8,84	93,75	4,42
ACUTE	87,50	8,84	87,50	8,84	87,50	8,84
SUSTENTION	50,00	8,84	56,25	4,42	53,12	2,21
VOICED	37,50	8,84	62,50	8,84	50,00	8,84
UNVOICED	62,50	26,52	50,00	0,00	56,25	13,26
SIBILATION	81,25	4,42	93,75	4,42	87,50	0,00
VOICED	62,50	8,84	999,99	0,00	81,25	4,42
UNVOICED	999,99	0,00	87,50	8,84	93,75	4,42
GRAVENESS	75,00	17,68	75,00	0,00	75,00	8,84
VOICED	87,50	8,84	999,99	0,00	93,75	4,42
UNVOICED	62,50	26,52	50,00	0,00	56,25	13,26
COMPACTNESS	999,99	0,00	81,25	13,26	90,62	6,63
VOICED	999,99	0,00	75,00	17,68	87,50	8,84
UNVOICED	999,99	0,00	87,50	8,84	93,75	4,42
TOTALS	83,33	4,42	80,21	5,16	81,77	4,79

TOTAL ORT SCORE:	MEAN	81,77
	S.E.	4,79

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

*****
FOR SPEAKER: JE *
*****

LISTENER	SCORE
OUE, JOHN	87,50
JONES, ROBERT	86,46

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	999,99	0,00	81,25	4,42	90,62	2,21
FRICTIONAL	999,99	0,00	87,50	8,84	93,75	4,42
NON-FRICTIONAL	999,99	0,00	75,00	17,68	87,50	8,84
NASALITY	999,99	0,00	93,75	4,42	96,87	2,21
GRAVE	999,99	0,00	87,50	8,84	93,75	4,42
ACUTE	999,99	0,00	999,99	0,00	999,99	0,00
SUSTENTION	56,25	4,42	62,50	8,84	59,37	2,21
VOICED	62,50	8,84	25,00	17,68	43,75	4,42
UNVOICED	50,00	0,00	999,99	0,00	75,00	0,00
SIBILATION	87,50	8,84	999,99	0,00	93,75	4,42
VOICED	999,99	0,00	999,99	0,00	999,99	0,00
UNVOICED	75,00	17,68	999,99	0,00	87,50	8,84
GRAVENESS	75,00	8,84	87,50	0,00	81,25	4,42
VOICED	999,99	0,00	999,99	0,00	999,99	0,00
UNVOICED	50,00	17,68	75,00	0,00	62,50	8,84
COMPACTNESS	999,99	0,00	999,99	0,00	999,99	0,00
VOICED	999,99	0,00	999,99	0,00	999,99	0,00
UNVOICED	999,99	0,00	999,99	0,00	999,99	0,00
TOTALS	86,46	0,74	87,50	0,00	86,98	0,37

TOTAL DRT SCORE:

MEAN	86,98
S.E.	0,37

SAMPLE TEST RUN

NUMBER LISTENERS = 2
NUMBER SPEAKERS = 2

COMBINED RESULTS - STANDARD ERRORS ACROSS SPEAKERS AND LISTENERS ******

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	999.99	0.00	84.37	5.18	92.19	2.59
FRICTIONAL	999.99	0.00	81.25	10.36	90.62	5.18
NON-FRICTIONAL	999.99	0.00	87.50	10.83	93.75	5.41
NASALITY	96.87	2.71	90.62	5.18	93.75	3.83
GRAVE	999.99	0.00	87.50	6.25	93.75	3.12
ACUTE	93.75	5.41	93.75	5.41	93.75	5.41
SUSTENTION	53.12	5.18	59.37	5.18	56.25	2.21
VOICED	50.00	8.84	43.75	13.62	46.87	5.18
UNVOICED	56.25	13.62	75.00	12.50	65.62	8.12
SIBILATION	84.37	5.18	96.87	2.71	90.62	2.71
VOICED	81.25	10.36	999.99	0.00	90.62	5.18
UNVOICED	87.50	10.83	93.75	5.41	90.62	5.18
GRAVENESS	75.00	9.00	81.25	3.12	78.12	5.18
VOICED	93.75	5.41	999.99	0.00	96.87	2.71
UNVOICED	56.25	16.24	62.50	6.25	59.37	8.12
COMPACTNESS	999.99	0.00	90.62	8.12	95.31	4.00
VOICED	999.99	0.00	87.50	10.83	93.75	5.41
UNVOICED	999.99	0.00	93.75	5.41	96.87	2.71
TOTALS	84.99	2.37	83.85	3.16	84.37	2.73

TOTAL DRT SCORE:

MEAN	84.37
S.E.	2.73

Appendix C

Diagnostic Rhyme Test
Scoring Software
and
Sample Printout
PDP-11 Implementation

```
** RSX-11M V03 **      21-MAR-78     13147159     DFA1:[200,200]XXX.FTN;171
** RSX-11M V03 **      21-MAR-78     13147159     DFA1:[200,200]XXX.FTN;171
** RSX-11M V03 **      21-MAR-78     13147159     DFA1:[200,200]XXX.FTN;171
```

```
X    X X    X X    X
X    X X    X X    X
 X X    X X    X X
  X       X       X
 X X    X X    X X
X    X X    X X    X    ::
X    X X    X X    X    ::
```

```
FFFFF TTTTT N    N    11     1    7777     1
F       T   N    N    11    11         7   11
F       T   NN   N          1        7    1
FFFF    T   N N  N    11    1       7     1
F       T   N  NN    11     1     7       1
F       T   N    N     1     1    7        1
F       T   N    N    1     111   7      111
```

```
** RSX-11M V03 **      21-MAR-78     13147159     DFA1:[200,200]XXX.FTN;171
** RSX-11M V03 **      21-MAR-78     13147159     DFA1:[200,200]XXX.FTN;171
** RSX-11M V03 **      21-MAR-78     13147159     DFA1:[200,200]XXX.FTN;171
```

```
C
      DIMENSION IBITS(16),IPACK(4)
      DIMENSION ISYS(4),IWDLST(4),ISPK(2),ILISTN(4),
     XICOL1(29),ICOL2(29)
      DIMENSION IEQUIV(74)
      DIMENSION IALPH(26)
      DIMENSION NLIO(23),IERR(23),KEYN(12),KEYL(12),KSPK1(12)
      DIMENSION KSPK2(12),NAME(4),LSYS(2),IHEAD(30)
      EQUIVALENCE (IRECNO,IEQUIV(1)),(IPGNO,IEQUIV(2)),
     X(ISYS(1),IEQUIV(3)),(IWDLST(1),IEQUIV(7)),(ISPK(1),IEQUIV(11)),
     X(ILISTN(1),IEQUIV(13)),(ICOL1(1),IEQUIV(17)),(ICOL2(1),IEQUIV(46))
      COMMON/PAGE/IPAGE(46,54)
      COMMON/ERRORS/IAWANT(54)
      DATA NMAX/74/
      DATA IBITS/"1,"2,"4,"10,"20,"40,"100,"200,"400,"1000,
     X"2000,"4000,"10000,"20000,"40000,"100000/
      DATA NAME(1),NAME(2),NAME(3),NAME(4)/2HZ.,0,0,0/
      DATA NAMEC/2HC./
      DATA K114,K110,MASK,MASK1,IBLNK
     X/"114,"110,"377,"77,2H  /
      DATA IGNORE,ISTART,ISTOP,IDROP,IENDFL
     X/"100000,"100001,"100002,"100003,"100010/
      DATA IALPH(1),IALPH(2),IALPH(3),IALPH(4),IALPH(5),
     X IALPH(6),IALPH(7),IALPH(8),IALPH(9),IALPH(10),
     X IALPH(11),IALPH(12),IALPH(13),IALPH(14),IALPH(15),IALPH(16),
     X IALPH(17),IALPH(18),IALPH(19),IALPH(20),IALPH(21),IALPH(22),
     X IALPH(23),IALPH(24),IALPH(25),IALPH(26)
     X /1HA,1HB,1HC,1HD,1HE,1HF,1HG,1HH,1HI,1HJ,1HK,1HL,1HM,1HN,
     X 1HO,1HP,1HQ,1HR,1HS,1HT,1HU,1HV,1HW,1HX,1HY,1HZ/
      DATA NLIO
     X/22,8150,9339,8923,1277,4096,6654,8667,3345,5154,1529,7121,5125,
     X6966,7350,2258,5406,9463,9557,8170,5345,9849,6964/
C
      DO 50 KK=1,30
      IHEAD(KK)=IBLNK
 50   IERR(KK)=-1
      DO 49 K=1,54
 49   IAWANT(K)=0
      RSDRSP=1.
      NRSPS=0.
      IRECNO=0
      IOPGNO=0
      IPTTF1=1
      CALL ASSIGN(3,'DF0:')
      CALL ASSIGN(4,'LP0:')
      CALL ASSIGN(5,'TI:')
      CALL ASSIGN(6,'TI:')
C
      WRITE(6,197)
 197  FORMAT(//1H5,'ENTER DATE OF TEST DD-MMM-YY (15-NOV-77) :')
      READ(5,571)(IHEAD(KK),KK=1,5)
 571  FORMAT(4A2,A1)
      WRITE(6,572)(IHEAD(KK),KK=1,5)
 572  FORMAT(1X,'THIS IS WHAT YOU SAID...: ',4A2,A1)
      WRITE(6,190)
 190  FORMAT(/1X,'ENTER HEADER INFO...ASD:')
      READ(5,189)(IHEAD(KK),KK=6,30)
 189  FORMAT(25A2)
 191  FORMAT(I1)
      WRITE(6,192)
 192  FORMAT(//1X,'***COPY TO DISK?,.TYPE 0 FOR NO, 1 FOR YES:')
      READ(5,191)IPOP11
```

```
      WRITE(6,193)
193   FORMAT(//1X,'***COPY TO PRINTER?',,TYPE 0 FOR NO; 1 FOR YES!')
      READ(5,195)IPOPLP
195   FORMAT(I2)
      IREPF=0
      IREST=0
      IIREST=IREST
      WRITE(6,199)
199   FORMAT(/1X,'ENTER #LISTENERS,#SPEAKERS,#SYSTEM,,I2I2I4',
     X/1X,'FOR EXAMPLE!0808!104 FOLLOWED BY CARRIAGE RETURN!')
      READ(5,292)NL,NS,LSYS(1),LSYS(2)
292   FORMAT(I2,I2,A2,A2)
      NAME(2)=LSYS(2)
      DECODE(4,1998,LSYS)ISYS
1998  FORMAT(4I1)
      IF(IPOP11.EQ.1)CALL ASSIGN(3,NAME)
      DO 310 K=1,NS
      WRITE(6,293)K
293  FORMAT(1X,'ENTER KEY AND SPEAKER (E,G,!!02BBV) FOR SPEAKER',I2)
      READ(5,294)KEYN(K),KEYL(K),KSPK1(K),KSPK2(K)
294   FORMAT(I3,A1,A1,A1)
310   CONTINUE
      WRITE(6,295)(KEYN(K),KEYL(K),KSPK1(K),KSPK2(K),K=1,NS)
295   FORMAT(///1X,'CHECK THE KEYS...'//(1X,I3,A1,A1,A1))
      PAUSE '***** READY TO GO *****'
      KLCTR=0
C
1     CONTINUE
      CALL RDPAGE
C
1001  CONTINUE
      IRECNO=IRECNO+1
C
      IPGNO=0
      DO 2 K=1,4
      IF(IPAGE(1,K+58),EQ,1)IPGNO=IPGNO+K
2     CONTINUE
      IF(IPGNO.EQ.0)WRITE(6,296)
296   FORMAT(1X,'EOF, ENTER 0 TO GO OR 1 TO STOP!')
      IF(IPGNO.EQ.0)READ(5,191)ISW
      IF(IPGNO.GT.4)PAUSE 'BAD PAGE#,FIX&RESUME'
      IF(IPGNO.GT.4)GO TO 1
      IF(((ISW.AND.1),EQ.1),AND.IPGNO.EQ.0)GO TO 9999
      IF(IPGNO.EQ.0)GO TO 1
      IF(IREST.EQ.1)GO TO 21
      IF(((IPGNO-IOPGNO).EQ.1).OR.((IPGNO-IOPGNO).EQ.-3))GO TO 21
      IF(IPGNO.EQ.IOPGNO)GO TO 22
      WRITE(6,198)IOPGNO,IPGNO
198   FORMAT(/1X,'SEQUENCE ERROR PG ',I1,' TO ',I1)
      PAUSE 'LOAD RIGHT PAGE,RESUME'
      GO TO 7883
22    CONTINUE
471   FORMAT(1X,'DO YOU WANT TO END THE RUN? 0=N,1=Y!')
      WRITE(6,194)
      WRITE(6,471)
      READ(5,191)IQFLG
      IF(IQFLG.EQ.1)GO TO 9999
194   FORMAT(1X,'REDUNDANT PAGE IGNORED.,.,')
      GO TO 7883
21    CONTINUE
      IREST=0
      IOPGNO=IPGNO
      IF(IPGNO.NE.1)GO TO 41
```

```
C
      KLCTR=KLCTR+1
C
      IDSYS=1000*ISYS(1)+100*ISYS(2)+10*ISYS(3)+ISYS(4)
C
      ITEMP=MOD(KLCTR-1,N8)+1
      IWDLST(1)=KEYN(ITEMP)/100
      IWDLST(2)=MOD((KEYN(ITEMP)/10),10)
      IWDLST(3)=MOD(KEYN(ITEMP),10)
      IWDLST(4)=KEYL(ITEMP).AND.MASK1
C
      IDNLIS=100*IWDLST(1)+10*IWDLST(2)+IWDLST(3)
C
      DO 3002 KK=1,4
      ILISTN(KK)=0
      DO 3002 K=1,10
      IF(IPAGE(KK+5,K+36).EQ.1)ILISTN(KK)=K-1
 3002 CONTINUE
      IDLIS=1000*ILISTN(1)+100*ILISTN(2)+10*ILISTN(3)+ILISTN(4)
C
C
      ISPK(1)=KSPK1(ITEMP).AND.MASK1
      ISPK(2)=KSPK2(ITEMP).AND.MASK1
C
C
 9100 CONTINUE
      ITEMP=NLID(1)+1
      DO 9110 KK=2,ITEMP
      IF(IDLIS.EQ.NLID(KK))GO TO 9200
 9110 CONTINUE
      WRITE(6,9190)IDLIS
 9190 FORMAT(/1X,'HEADER ERROR,BAD LISTENER ID ',I4/1X,
     X'ENTER CORRECTED ID...  EXAMPLE:5695')
      READ(5,9093)(ILISTN(ITEMP),ITEMP=1,4)
 9093 FORMAT(4I1)
      IDLIS=1000*ILISTN(1)+100*ILISTN(2)+10*ILISTN(3)+ILISTN(4)
      GO TO 9100
 9200 CONTINUE
      IF(IERR(KK).LT.0)IERR(KK)=0
C
 41   CONTINUE
C
      DO 5 KK=1,29
      ISUM=0
      IF(IPAGE(KK+14,8).EQ.1)ISUM=ISUM-4
      IF(IPAGE(KK+14,9).EQ.1)ISUM=ISUM-3
      IF(IPAGE(KK+14,10).EQ.1)ISUM=ISUM-2
      IF(IPAGE(KK+14,11).EQ.1)ISUM=ISUM-1
      IF(IPAGE(KK+14,13).EQ.1)ISUM=ISUM+1
      IF(IPAGE(KK+14,14).EQ.1)ISUM=ISUM+2
      IF(IPAGE(KK+14,15).EQ.1)ISUM=ISUM+3
      IF(IPAGE(KK+14,16).EQ.1)ISUM=ISUM+4
      IF(IPAGE(KK+14,3).EQ.1)ISUM=-ISUM
      ICOL1(KK)=MOD(KK,2)
      IF(ISUM.LT.0)ICOL1(KK)=0
      IF(ISUM.GT.0)ICOL1(KK)=1
      RRSPS=RRSPS+1.
      IF(ISUM.NE.0)GO TO 51
      RBORSP=RBORSP+1.
      ITEMP=NLID(1)+1
      DO 51 K=2,ITEMP
      IF(IDLIS.EQ.NLID(K))IERR(K)=IERR(K)+1
 51   CONTINUE
```

```
 601    CONTINUE
 6      CONTINUE
C
        DO 6 KK=1,29
        ISUM=0
        IF(IPAGE(KK+14,39).EQ.1)ISUM=ISUM+4
        IF(IPAGE(KK+14,40).EQ.1)ISUM=ISUM+3
        IF(IPAGE(KK+14,41).EQ.1)ISUM=ISUM+2
        IF(IPAGE(KK+14,42).EQ.1)ISUM=ISUM+1
        IF(IPAGE(KK+14,44).EQ.1)ISUM=ISUM+1
        IF(IPAGE(KK+14,45).EQ.1)ISUM=ISUM+2
        IF(IPAGE(KK+14,46).EQ.1)ISUM=ISUM+3
        IF(IPAGE(KK+14,47).EQ.1)ISUM=ISUM+4
        IF(IPAGE(KK+14,52).EQ.1)ISUM=-ISUM
        ICOL2(KK)=MOD(KK,2)
        IF(ISUM.LT.0)ICOL2(KK)=0
        IF(ISUM.GT.0)ICOL2(KK)=1
        RRSPS=RRSPS+1.
        IF(ISUM.NE.0)GO TO 601
        RBORSP=RBORSP+1.
        ITEMP=NLID(1)+1
        DO 52 K=2,ITEMP
        IF(IDLIS.EQ.NLID(K))IERR(K)=IERR(K)+1
 52     CONTINUE
 601    CONTINUE
 6      CONTINUE
C
        IF(IPOPLP.EQ.0)GO TO 7001
        WRITE(4,90)IPGNO,IDSYS,IALPH(ISPK(1)),IALPH(ISPK(2)),
     XIDLIS,IOWLIS,IALPH(IWDLST(4))
 90     FORMAT(1H1/56X,5HPAGE ,I1,5H OF 4/
     X 1X,8HSYSTEM: ,I4/1X,8HSPEAKR: ,2A1/1X,
     X8HLISNER: ,I4/1X,8HWDLIST: ,I3.A1/////)
        DO 7 K=1,29
        IF((ICOL1(K).EQ.0).AND.(ICOL2(K).EQ.0))WRITE(4,91)K,K
        IF((ICOL1(K).EQ.0).AND.(ICOL2(K).EQ.1))WRITE(4,92)K,K
        IF((ICOL1(K).EQ.1).AND.(ICOL2(K).EQ.0))WRITE(4,93)K,K
        IF((ICOL1(K).EQ.1).AND.(ICOL2(K).EQ.1))WRITE(4,94)K,K
 91     FORMAT(5X,I2,3H***,10X,4HX    ,16X,4HX    ,10X,3H***,I2)
 92     FORMAT(5X,I2,3H***,10X,4HX    ,16X,4H    X,10X,3H***,I2)
 93     FORMAT(5X,I2,3H***,10X,4H    X,16X,4HX    ,10X,3H***,I2)
 94     FORMAT(5X,I2,3H***,10X,4H    X,16X,4H    X,10X,3H***,I2)
 7      CONTINUE
C
 7001   CONTINUE
C
 9      CONTINUE
        IF(IPOP11.NE.1)GO TO 7003
        IF(IPTTP1.EQ.0.OR.IIREST.EQ.1)GO TO 910
        IPTTP1=0
        WRITE(3)NL,NS,(IHEAD(K),K=1,30)
        WRITE(1)NL,NS,(IHEAD(K),K=1,30)
 910    CONTINUE
        WRITE(3)(IE  JIV(K),K=1,NMAX)
        DO 3701 K=
 3701   IPACK(K)=0
        DO 3702 K=1,3
        DO 3702 NBIT=1,16
        IF(IEQUIV(16*K+NBIT).NE.0)IPACK(K)=IPACK(K).OR.IBITS(NBIT)
 3702   CONTINUE
        DO 3703 K=4,4
        DO 3703 NBIT=1,10
        IF(IEQUIV(16*K+NBIT).NE.0)IPACK(K)=IPACK(K).OR.IBITS(NBIT)
```

```
 3703    CONTINUE
         WRITE(1)(IEQUIV(K),K=1,16),(IPACK(K),K=1,4)
C
 7003    CONTINUE
C
         GO TO 1
C
 9999    CONTINUE
         RTEMP=(RBDRSP/RRSPS)*100.
         WRITE(6,298)RBDRSP,RRSPS,RTEMP,INSYS
 298     FORMAT(/1X,' BAD MARKS,MARKS % ... ',F7.0,1X,F7.0,1X,F5.1/
     X1X,'****SYSTEM # ',I4)
         ITEMP=NLID(1)+1
         DO 53 KK=2,ITEMP
         RTEMP=(IERR(KK)/RRDRSP)*100.
         IF(IERR(KK).GE.0)WRITE(6,291)NLID(KK),IERR(KK),RTEMP
 291     FORMAT(1X,'LISTENER ',I4,5X,I4,' ERRORS',2X,' %',F5.1)
 53      CONTINUE
         WRITE(6,9998)(MIN0(IAWANT(K),9),K=1,54)
 9998    FORMAT(1X,10(5I1,1X),4I1)
         STOP '*** FINISHED ***'
         END
         SUBROUTINE RDPAGE
C
         DIMENSION ICOM(3)
         COMMON/CHARB/ICHARB(500)
         COMMON/IOPAGE/IARRAY(4000)
         DATA ICOM/"201,"005,"021/,ICR/"215/,IEP/"012/
C
         IBASE=(((("176500,AND,"77777)+"60000)/2)+1
C
         CALL WAIT(4,2,MDUMMY)
C
 100     CONTINUE
         IARRAY(IBASE+2)="21
         IARRAY(IBASE+0)="21
         OLDTIM=SECNDS(0.)
         DO 103 K=1,3
 101     CONTINUE
         IF((IARRAY(IBASE+2).AND."200).NE."000)GO TO 102
         IF((SECNDS(0.)-OLDTIM).LT..5)GO TO 101
         WRITE(6,1000)
 1000    FORMAT(1X,'*** DMR NOT RECEIVING, YOU MUST RESET DMR.')
         PAUSE 'RES TO CONTINUE'
         GO TO 100
 102     CONTINUE
         IARRAY(IBASE+3)=ICOM(K)
 103     CONTINUE
C
         INX=1
         OLDTIM=SECNDS(0.)
 200     CONTINUE
         IF((IARRAY(IBASE+0).AND."200).EQ."000)GO TO 300
         ICHARB(INX)=IARRAY(IBASE+1).AND."377
         TIME=SECNDS(0.)
         OLDTIM=TIME
         IF((ICHARB(INX).EQ.ICR).AND.(INX.GT.1).AND.(ICHARB(INX-1)
     X.EQ.IEP))GO TO 400
         INX=INX+1
         GO TO 200
 300     CONTINUE
         IF((SECNDS(0.)-OLDTIM).LE.11.)GO TO 200
         WRITE(6,1001)
```

```
1001   FORMAT(1X,'*** OMR NOT SENDING EP/CR. YOU MUST RESET OMR AND RE
     XREAD THE PAGE!')
       PAUSE 'RES TO CONTINUE'
       GO TO 100
400    CONTINUE
       CALL SCAN(IERRFG,INX)
       IF(IERRFG.EQ.1)GO TO 100
       RETURN
       END
       SUBROUTINE SCAN(IERRFG,INX)
       DIMENSION IBITS(6)
       COMMON/CHARB/ICHARB(500)
       COMMON/PAGE/IPAGE(46,54)
       COMMON/ERRORS/IAWANT(54)
       DATA IBITS/"40,"20,"10,"4,"2,"1/
C
       IVAL(K)=ICHARB(K).AND."77
C
       DO 99 K=1,46
       DO 99 KK=1,54
 99    IPAGE(K,KK)=0
C
       IROW=-1
       NPTR=0
 100   CONTINUE
       NPTR=NPTR+1
       IF(ICHARB(NPTR).EQ."215)GO TO 200
       IF(NPTR.LT.INX)GO TO 100
       STOP 'IMPOSSIBLE'
 200   CONTINUE
       MPTR=NPTR
 201   CONTINUE
       MPTR=MPTR+1
       IF(ICHARB(MPTR).EQ."215)GO TO 300
       IF(MPTR.LT.INX)GO TO 201
       STOP 'IMPOSSIBLE'
 300   CONTINUE
       N=((MPTR-NPTR)-1)/10
       NPTR=NPTR+1
       DO 301 KKK=1,N
       ITEMP=IVAL(NPTR+10*(KKK-1))
       IF(ITEMP.GT.IROW)GO TO 3001
       IAWANT(IROW+1)=IAWANT(IROW+1)+1
       GO TO 301
 3001  CONTINUE
       IROW=ITEMP
       DO 301 K=1,9
       DO 301 KK=1,6
       IF((IBITS(KK).AND.ICHARB(NPTR+10*(KKK-1)+K)).NE.0)
     XIPAGE(IROW+1,6*(K-1)+KK)=1
 301   CONTINUE
       NPTR=MPTR-1
       IF(MPTR.LT.INX)GO TO 100
       IERRFG=0
       NROWER=0
       DO 401 K=15,43
       DO 400 KK=1,54
       IF(IPAGE(K,KK).EQ.1)GO TO 401
 400   CONTINUE
       NROWER=NROWER+1
 401   CONTINUE
       IF(NROWER.LE.1)RETURN
       WRITE(6,1000)NROWER
```

```
1000    FORMAT(1X,'*** ',I2,' MISSED RESPONSE ROWS ON THIS PAGE,'/
     X1X,'TYPE IN A 1 TO REREAD THE PA   .'/
     X1X,'TYPE IN A 0 TO ACCEPT PAGE AS IS...')
        READ(5,1001)ITEMP
1001    FORMAT(I1)
        IF(ITEMP.EQ.0)RETURN
        PAUSE 'RES TO CONTINUE'
        IERRFG=1
        RETURN
        END
```

```
** RSX-11M V03 **      21-MAR-78     13148154     DF0:[200,200]XFER.FTN;504
** RSX-11M V03 **      21-MAR-78     13148154     DF0:[200,200]XFER.FTN;504
** RSX-11M V03 **      21-MAR-78     13148154     DF0:[200,200]XFER.FTN;504
```

```
X    X FFFFF EEEEE RRRR
X    X F     E     R   R
 X X  F     E     R   R
  X   FFFF  EEEE  RRRR
 X X  F     E     R R
X   X F     E     R  R    ..
X   X F     EEEEE R   R   ..
```

```
FFFFF TTTTT N    N   II  55555  000  4   4
F       T   N    N   II  5     0   0 4   4
F       T   NN   N       555   0   00 4   4
FFFF    T   N N  N   II     5  0 0 0 44444
F       T   N  NN   II      5 00  0     4
F       T   N    N   I  5   5 0   0     4
F       T   N    N   I   555   000      4
```

```
** RSX-11M V03 **      21-MAR-78     13148154     DF0:[200,200]XFER.FTN;504
** RSX-11M V03 **      21-MAR-78     13148154     DF0:[200,200]XFER.FTN;504
** RSX-11M V03 **      21-MAR-78     13148154     DF0:[200,200]XFER.FTN;504
```

```
C
      LOGICAL*1 KYBADL,KYGODL
      DIMENSION IEQUIV(74)
      DIMENSION NAME(4),LSYS(2),IHEAD(30),LDEL(20),LSDEL(6)
      DIMENSION ISYS(4),IWDLST(4),ISPK(2),ILISTN(4),
     X  ICOL1(20),ICOL2(20)
      EQUIVALENCE (IRECNO,IEQUIV(1)),(IPGNO,IEQUIV(2)),
     X  (ISYS(1),IEQUIV(3)),(IWDLST(1),IEQUIV(7)),
     X  (ISPK(1),IEQUIV(11)),(ILISTN(1),IEQUIV(13)),
     X  (ICOL1(1),IEQUIV(17)),(ICOL2(1),IEQUIV(40))
      DATA MASK/"377/,M100/"100/
      DATA IGNORE,ISTART,ISTOP,IDROP,IFNDEL
     X  /"100000,"100001,"100002,"100003,"100010/
      DATA NAME(1),NAME(2),NAME(3),NAME(4)/2HZ.,0,0,0/
C
      CALL ASSIGN(3,'DF:')
      CALL ASSIGN(4,'DF:')
      CALL ASSIGN(5,'TI:')
      CALL ASSIGN(6,'TI:')
      KEYBAD=0
      IOLID=0
      ICSP=0
      IOSID1=0
      IOSID2=0
      DO 101 K=1,6
101   LSDEL(K)=0
      DO 100 K=1,20
100   LDEL(K)=0
C
      WRITE(6,190)
190   FORMAT(/1X,/
     X1X,'ENTER SYSTEM ID ...I4')
      READ(5,191)LSYS(1),LSYS(2)
191   FORMAT(A2,A2)
      NAME(2)=LSYS(2)
      DECODE(4,1990,LSYS)ISYSID
1990  FORMAT(I4)
      CALL ASSIGN(3,NAME)
      READ(3)NL,NS,(IHEAD(K),K=1,30)
      WRITE(6,1994)(IHEAD(K),K=1,30)
1994  FORMAT(/1X,30A2/)
      WRITE(6,192)
192   FORMAT(/1X,'HOW MANY LISTENERS TO DELETE?,.I2')
      READ(5,193)NDEL
193   FORMAT(I2)
      WRITE(6,179)
179   FORMAT(/1X,'HOW MANY SPEAKERS TO DELETE?..I2')
      READ(5,193)NSDEL
      IF(NDEL.LE.0)GO TO 399
      DO 398 K=1,NDEL
      WRITE(6,194)
194   FORMAT(/1X,'ENTER LISTENER ID TO DELETE..I4')
      READ(5,195)LDEL(K)
195   FORMAT(I4)
398   CONTINUE
399   CONTINUE
      IF(NSDEL.LE.0)GO TO 319
      DO 3991 K=1,NSDEL
      WRITE(6,198)
198   FORMAT(/1X,'ENTER SPEAKER TO DELETE...A2')
      READ(5,199)LSDEL(K)
199   FORMAT(A2)
```

```
3091    CONTINUE
310     CONTINUE
        WRITE(6,196)
196     FORMAT(/1X,'ENTER ANY INCORRECT-CORRECTED KEY PAIR (0 IF OK)')
        READ(5,197)KYBAD,KYBADL,KYGOOD,KYGODL
197     FORMAT(I3,A1,I3,A1)
        NL=NL-NDEL
        NS=NS-NSDEL
C
        IF(ICSP.EQ.1)CALL CSPIO(1,ISTART)
        IDATA=ISYSID.AND.MASK
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
        IDATA=ISHFT(ISYSID,-8)
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
        IDATA=NL.AND.MASK
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
        IDATA=ISHFT(NL,-8)
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
        IDATA=NS.AND.MASK
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
        IDATA=ISHFT(NS,-8)
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
        DO 80 K=1,30
        IDATA=ISHFT(IHEAD(K),-8)
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
        IDATA=IHEAD(K).AND.MASK
        IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
80      CONTINUE
        IF(ICSP.EQ.1)CALL CSPIO(1,ISTOP)
        IF(ICSP.EQ.0)WRITE(4,8000)ISYSID,NL,NS,(IHEAD(K),K=1,30)
8000    FORMAT(I4,I3,I3,30A2)
C
1       CONTINUE
        READ(3,END=999)(IEQUIV(K),K=1,74)
        IF(IPGNO.NE.1)GO TO 2
        ITLID=1000*ILISTN(1)+100*ILISTN(2)+10*ILISTN(3)+ILISTN(4)
        IIDATA=ISHFT(((IEQUIV(12).AND.MASK)+M100),8)+
     X((IEQUIV(11).AND.MASK)+M100)
        IF(NSDEL.LE.0)GO TO 109
        DO 1091 K=1,NSDEL
        IF(IIDATA.EQ.LSDEL(K))GO TO 1
1091    CONTINUE
109     CONTINUE
        IF(NDEL.LE.0)GO TO 110
        DO 11 K=1,NDEL
        IF(ITLID.EQ.LDEL(K))GO TO 1
11      CONTINUE
110     CONTINUE
        IF(ITLID.NE.IOLID)GO TO 31
21      CONTINUE
        GO TO 32
22      CONTINUE
2       CONTINUE
        IF(NSDEL.LE.0)GO TO 211
        DO 2110 K=1,NSDEL
        IF(IIDATA.EQ.LSDEL(K))GO TO 1
2110    CONTINUE
211     CONTINUE
        IF(NDEL.LE.0)GO TO 210
        DO 12 K=1,NDEL
        IF(ITLID.EQ.LDEL(K))GO TO 1
12      CONTINUE
210     CONTINUE
```

```
      IF(ICSP.EQ.1)CALL CSPIO(1,ISTART)
      DO 3 K=17,74
      IDATA=IEQUIV(K).AND.MASK
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IDATA=ISHFT(IEQUIV(K),-8)
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
    3 CONTINUE
      IF(ICSP.EQ.1)CALL CSPIO(1,ISTOP)
      IF(ICSP.EQ.0)WRITE(4,8881)(IEQUIV(K),K=17,74)
 8881 FORMAT(5R11)
      GO TO 1
C
   31 CONTINUE
      IF(ICSP.EQ.1)CALL CSPIO(1,ISTART)
      IDATA=ITLID.AND.MASK
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IDATA=ISHFT(ITLID,-8)
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IF(ICSP.EQ.1)CALL CSPIO(1,ISTOP)
      IF(ICSP.EQ.0)WRITE(4,8882)ITLID
 8882 FORMAT(I4)
      IOLID=ITLID
      GO TO 21
C
   32 CONTINUE
      IF(ICSP.EQ.1)CALL CSPIO(1,ISTART)
      IDATA=(IEQUIV(12).AND.MASK)+M100
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IDATA=(IEQUIV(11).AND.MASK)+M100
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IIDATA=ISHFT(((IEQUIV(12).AND.MASK)+M100),8)+
     X((IEQUIV(11).AND.MASK)+M100)
      IKEYN=100+IEQUIV(7)+10+IEQUIV(8)+IEQUIV(9)
      IF(IKEYN.EQ.KYBAD)KEYBAD=1
      IF(IKEYN.EQ.KYBAD)IKEYN=KYGOOD
      IDATA=IKEYN.AND.MASK
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IDATA=ISHFT(IKEYN,-8)
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IDATA=(IEQUIV(10).AND.MASK)+M100
      IKEYL=ISHFT(((IEQUIV(10).AND.MASK)+M100),-8)+
     X((IEQUIV(10).AND.MASK)+M100)
      IF(KEYBAD.EQ.1)IKEYL=KYGOOD
      KEYBAD=0
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IF(ICSP.EQ.1)CALL CSPIO(1,IDATA)
      IF(ICSP.EQ.1)CALL CSPIO(1,ISTOP)
C
C
      IF(ICSP.EQ.0)WRITE(4,8818)IIDATA,IKEYN,IKEYL,IKEYL
 8818 FORMAT(A2,I3,A1,A1)
      IOSID1=ISPK(1)
      IOSID2=ISPK(2)
      GO TO 22
C
  999 CONTINUE
      IF(ICSP.EQ.1)CALL CSPIO(1,IENDFL)
      IF(ICSP.EQ.1)CALL CSPIO(1,IENDFL)
      IF(ICSP.EQ.0)ENDFILE 4
      IF(ICSP.EQ.0)ENDFILE 4
      STOP
      END
```

```
** RSX-11M V03 **      21-MAR-78      13:49:29      DF0:[200,200]SCORE.FTN;7
** RSX-11M V03 **      21-MAR-78      13:49:29      DF0:[200,200]SCORE.FTN;7
** RSX-11M V03 **      21-MAR-78      13:49:29      DF0:[200,200]SCORE.FTN;7
```

```
  SSSSSSSS     CCCCCCCC     000000     RRRRRRRR     EEEEEEEEEE
  SSSSSSSS     CCCCCCCC     000000     RRRRRRRR     EEEEEEEEEE
SS           CC           00    00   RR     RR   EE
SS           CC           00    00   RR     RR   EE
SS           CC           00    00   RR     RR   EE
SS           CC           00    00   RR     RR   EE
  SSSSSS     CC           00    00   RRRRRRRR    EEEEEEEE
  SSSSSS     CC           00    00   RRRRRRRR    EEEEEEEE
       SS    CC           00    00   RR  RR      EE
       SS    CC           00    00   RR  RR      EE
       SS    CC           00    00   RR    RR    EE                    ****
       SS    CC           00    00   RR    RR    EE                    ****
SSSSSSSS     CCCCCCCC     000000     RR     RR   EEEEEEEEEE            ****
SSSSSSSS     CCCCCCCC     000000     RR     RR   EEEEEEEEEE            ****
```

```
FFFFFFFFFF   TTTTTTTTTT   NN      NN      1111     77777777
FFFFFFFFFF   TTTTTTTTTT   NN      NN      1111     77777777
FF               TT       NN      NN      1111           77
FF               TT       NN      NN      1111           77
FF               TT       NNNN    NN                     77
FF               TT       NNNN    NN                     77
FFFFFFFF         TT       NN  NN  NN      1111         77
FFFFFFFF         TT       NN  NN  NN      1111         77
FF               TT       NN    NNNN      1111       77
FF               TT       NN    NNNN      1111       77
FF               TT       NN      NN        11     77
FF               TT       NN      NN        11     77
FF               TT       NN      NN      11       77
FF               TT       NN      NN      11       77
```

```
** RSX-11M V03 **      21-MAR-78      13:49:29      DF0:[200,200]SCORE.FTN;7
** RSX-11M V03 **      21-MAR-78      13:49:29      DF0:[200,200]SCORE.FTN;7
** RSX-11M V03 **      21-MAR-78      13:49:29      DF0:[200,200]SCORE.FTN;7
```

```
C
      COMMON/A/IDSYS,ISYS(50),NAME(15),NPAGE(7,2,3),
     X MSPK(15,9),MKEY,LETTER,LIST,ISPK,NUML,NUMS,ARRAY(60),IRESP(2,29),
     XDATA(12,6,30)
C
      CALL ASSIGN(3,'DF:RHYME.KEY',KEY1)
      CALL ASSIGN(4,'DF:',1)
      ICOM=0
 1    CONTINUE
      CALL CTL(ICOM)
      CALL SCORE(ICOM)
      IF(ICOM.EQ.0)CALL MATH
      GO TO 1
      END
      SUBROUTINE CTL(ICOM)
C
C
C
C     DIAGNOSTIC RHYME TEST SCORING PROGRAM
C
C
C
C                                                    3 DEC 78
C
C
C
C     STEVEN MEISTER, ESD/MCEL, HANSCOM AFB, MA 01731
C
C
C
C
C
C     NUMSUB = NUMBER OF SUBFEATURES CORRECT EACH LISTENER
C     NUMT = NUMBER OF MAIN FEATURES CORRECT EACH LISTENER
C     NUML = NUMBER OF LISTENERS
C     NUMS = NUMBER OF SPEAKERS
C     LIST = CURRENT LISTENER
C     ISPKR = CURRENT SPEAKER
C     IKEY = CURRENT KEY NUMBER
C     NKEY = CURRENT KEY INDEX NUMBER FOR KEY ARRAY
C     IPAGE = PAGE BEING SCORED
C     IFEAT = INDEX FOR MAIN FEATURES
C                     1 = VOICING
C                     2 = NASALITY
C                     3 = SUSTENTION
C                     4 = SIBILATION
C                     5 = GRAVENESS
C                     6 = COMPACTNESS
C                     7 = EXPERIMENTAL
C
C     FEATURE ARRAY KEY:
C
C                     PRESENT ABSENT
C     MAIN FEATURE    (L,1,1) (L,2,1)      L = LISTENER NUMBER
C     SUB FEAT PRES   (L,1,2) (L,2,2)
C     SUB FEAT ABS    (L,1,3) (L,2,3)
C
C     FEAT(1O,N,M) = MEAN FOR N,M
C     FEAT(2O,N,M) = STANDARD ERROR FOR N,M
C     FEAT(1O,1,M) = MEAN FOR PRESENT + ABSENT STATE OF M
C     FEAT(1O,2,M) = S.E. FOR PRESENT + ABSENT STATE OF M
C
C
```

```
C
C       PAGE(I,J,K) AND NPAGE(I,J,K):
C                       I = FEATURE
C                       J = 1:PRESENT  2:ABSENT
C                       K = 1:MAIN  2:SUB PRES  3:SUB ABS
C
C
C
        DIMENSION KEY(50),KEYSUB(50,2)
        DIMENSION NEWKEY(50,60)
C
C
        COMMON/A/IDSYS,ISYSTE(50),NAME(15),
     1  NPAGE(7,2,3), MSPK(15,0),NKEY,LETTER,
     1  LIST,ISPK,NUML,NUMS,ARRAY(60),IRESP(2,29),DATA(12,6,36)
        INTEGER ANSWER
C
C
C
C
C
        DATA IALPHA,IALPHB/2HAA,2HBB/
C       SUB FEATURES KEY
        DATA KEYSUB/0,0,1,0,1,0,3*1,3*0,1,1,5*0,1,0,1,1,4*0,1,3*0,3*1,
     1  3*0,1,0,1,0,1,3*0,7*1,0,1,4*0,1,1,0,1,0,1,3*0,1,0,1,3*0,1,1,
     1  0,1,0,1,1,0,4*1,3*0,1,3*0,3*1,0,3*1,0,3*1,0,1,5*0,1,0,4*1/
C
C       READ: SYSTEM, NUMBER LISTENERS, NUMBER SPEAKERS
C
        IF(ICOM.NE.0)GO TO 1040
        LIST=0
        CALL ASSIGN(6,'DF0:')
C
        READ(3)NEWKEY
        READ(4,103)IDSYS,NUML,NUMS,(ISYSTE(I),I=1,30)
 103    FORMAT(I4,I3,I3,30A2)
 1000   CONTINUE
        IF((LIST+1).GT.NUML)GO TO 200
        LIST=LIST+1
        ISPK=0
C
C       READ LISTENER ID
C
        READ(4,104)NAME(LIST)
 104    FORMAT(I4)
 1040   CONTINUE
        IF((ISPK+1).GT.NUMS)GO TO 1000
        ISPK=ISPK+1
        DO 610 I=1,7
        DO 610 J=1,2
        DO 610 K=1,3
 610    NPAGE(I,J,K) = 0
C
C       READ SPEAKER NAME, KEY NUMBER AND LETTER
C
        READ(4,1030)MSPK(LIST,ISPK),NKEY,LETTER
 1030   FORMAT(A2,I3,A2)
        NKEY = NKEY
        DO 801 KK=102,108
        IF(NKEY.NE.KK)GO TO 801
        NKEY=2*(KK-102)+1
        GO TO 150
 801    CONTINUE
```

```
  807     IF(NKEY.NE.111)GO TO 808
          NKEY=15
          GO TO 150
  808     IF(NKEY.NE.112)GO TO 809
          NKEY=17
          GO TO 150
  809     IF(NKEY.NE.113)GO TO 810
          NKEY=19
          GO TO 150
  810     IF(NKEY.NE.115)GO TO 811
          NKEY=21
          GO TO 150
  811     IF(NKEY.NE.116)GO TO 812
          NKEY=23
          GO TO 150
  812     IF(NKEY.GT.318)GO TO 151
          IF(NKEY.LE.300)GO TO 151
          NKEY=25+2*(NKEY-301)
          GO TO 150
  150     IF(LETTER.NE.IALPHA)GO TO 1501
          NKEY=NKEY+1
          GO TO 152
 1501     IF(LETTER.EQ.IALPHA)GO TO 152
  151     WRITE(5,300)NKEY,LETTER
  300     FORMAT(///' ******  NO KEY ',I3,A1,' ******'///)
          STOP
  152     CONTINUE
C
C
C
          DO 1527 K=1,58
 1527     KEY(K)=NEWKEY(K,NKEY)
C
C
C
          DO 110 IPAGE = 1,4
C
C         READ CURRENT PAGE
C
  106     READ(4,107)((IRESP(ICOL,IROW),IROW=1,29),ICOL=1,2)
C
C
C
C
C
C
  107     FORMAT(58I1)
          DO 203 ICOL=1,2
          DO 204 IROW =2,29
C         ESTABLISH FEATURE BEING SCORED
          IF(IROW.LE.8)IFEAT=IROW-1
          ITEMP =IROW-1
          IFEAT=MOD(ITEMP,7)
          IF(IFEAT.EQ.0)IFEAT=7
C         ESTABLISH WHICH COLUMN PRESENT STATE OF FEATURE IS IN.
          IPRES=1
          IF(IPAGE.LE.2)IPRES=0
C         FIND KEY ELEMENT
          KEYEL=IROW
          IF(ICOL.EQ.2)KEYEL=IROW+29
          INDEX = 2
          IF(IPAGE.EQ.1)GOTO 208
          IF(IPAGE.EQ.3)GOTO 208
```

```
      IF(KEY(KEYEL).NE.IPRES)INDEX=1
      GOTO 299
  298 IF(KEY(KEYEL).EQ.IPRES)INDEX=1
C     INDEX =1 IMPLIES MAIN FEATURE PRESENT; 2 IMPLIES ABSENT.
C     SCORE THE RESPONSE
  299 ANSWER = 0
      IF(IPAGE.EQ.1)GOTO 295
      IF(IPAGE.EQ.3) GOTO 295
      IF(KEY(KEYEL).NE.IRESP(ICOL,IROW))ANSWER=1
      GOTO 296
  295 IF(KEY(KEYEL).EQ.IRESP(ICOL,IROW))ANSWER=1
  296 CONTINUE
      IF(IFEAT.EQ.7)GOTO 257
      ISUBP=2
      NSUBP=2
      IF(IPAGE.EQ.1)ISUBP=1
      IF(IPAGE.EQ.3)ISUBP=1
      IF(KEYSUB(KEYEL,ISUBP).EQ.0)NSUBP=3
      GOTO(251,252,253,254,255,256),IFEAT
  251 NPAGE(1,INDEX,1)=NPAGE(1,INDEX,1)+ANSWER
      NPAGE(1,INDEX,NSUBP) =NPAGE(1,INDEX,NSUBP)+ANSWER
      GOTO 260
  252 NPAGE(2,INDEX,1)=NPAGE(2,INDEX,1)+ANSWER
      NPAGE(2,INDEX,NSUBP)=NPAGE(2,INDEX,NSUBP)+ANSWER
      GOTO 260
  253 NPAGE(3,INDEX,1)=NPAGE(3,INDEX,1)+ANSWER
      NPAGE(3,INDEX,NSUBP)=NPAGE(3,INDEX,NSUBP)+ANSWER
      GOTO 260
  254 NPAGE(4,INDEX,1)=NPAGE(4,INDEX,1)+ANSWER
      NPAGE(4,INDEX,NSUBP)=NPAGE(4,INDEX,NSUBP)+ANSWER
      GOTO 260
  255 NPAGE(5,INDEX,1)=NPAGE(5,INDEX,1)+ANSWER
      NPAGE(5,INDEX,NSUBP)=NPAGE(5,INDEX,NSUBP)+ANSWER
      GOTO 260
  256 NPAGE(6,INDEX,1)=NPAGE(6,INDEX,1)+ANSWER
      NPAGE(6,INDEX,NSUBP)=NPAGE(6,INDEX,NSUBP)+ANSWER
      GOTO 260
  257 NPAGE(7,INDEX,1)=NPAGE(7,INDEX,1)+ANSWER
  260 CONTINUE
  294 CONTINUE
  293 CONTINUE
C
C
C
C
  110 CONTINUE
C
C
C
      ICOM=1
      RETURN
C
C
C
  201 CONTINUE
C
C
C
  204 CONTINUE
      ICOM=2
      RETURN
      END
      SUBROUTINE SCORE(IPLACE)
```

```
C
C
      COMMON/A/IDSYS,ISYS(50),NAME(15),NPAGE(7,2,3),
     1MSPK(15,9),MKEY,LETTER,LIST,ISPK,NUML,NUMS,ARRAY(60),IRESP(2,29),
     XDATA(12,6,36)
      DIMENSION SEND(6),TEMP(2,9)
      IF(NPLACE.NE.1)GOTO 2
 1    FORMAT(' SYSTEM TESTED: ',I4,3X,30A2//5X,'NUMBER LISTENERS =',I3/
     1  5X,'NUMBER SPEAKERS  =',I3//)
 500  FORMAT(1H1)
 5000 CONTINUE
      DO 20 I=1,6
      DO 22 K=1,3
      DO 41 J=1,2
      L = 6*I+J+2*K-8
      NTOT = 16
      IF(K.NE.1)NTOT=8
C
C
C
C
 61   TOT = FLOAT(NTOT)
      DATA(LIST,ISPK,L)=(2.*FLOAT(NPAGE(I,J,K))-TOT)*100./TOT
      NPAGE(I,J,K) = NTOT-NPAGE(I,J,K)
 41   CONTINUE
 22   CONTINUE
 20   CONTINUE
      IF((ISW.AND.1).EQ.0)RETURN
C     WRITE(6,276)
C     WRITE(6,277)(NPAGE(1,J,1),J=1,2)
C     WRITE(6,278)(NPAGE(1,J,2),J=1,2)
C     WRITE(6,279)(NPAGE(1,J,3),J=1,2)
C     WRITE(6,280)(NPAGE(2,J,1),J=1,2)
C     WRITE(6,281)(NPAGE(2,J,2),J=1,2)
C     WRITE(6,282)(NPAGE(2,J,3),J=1,2)
C     WRITE(6,283)(NPAGE(3,J,1),J=1,2)
C     WRITE(6,284)(NPAGE(3,J,2),J=1,2)
C     WRITE(6,285)(NPAGE(3,J,3),J=1,2)
C     WRITE(6,286)(NPAGE(4,J,1),J=1,2)
C     WRITE(6,284)(NPAGE(4,J,2),J=1,2)
C     WRITE(6,285)(NPAGE(4,J,3),J=1,2)
C     WRITE(6,287)(NPAGE(5,J,1),J=1,2)
C     WRITE(6,284)(NPAGE(5,J,2),J=1,2)
C     WRITE(6,285)(NPAGE(5,J,3),J=1,2)
C     WRITE(6,288)(NPAGE(6,J,1),J=1,2)
C     WRITE(6,284)(NPAGE(6,J,2),J=1,2)
C     WRITE(6,285)(NPAGE(6,J,3),J=1,2)
C021  FORMAT(10X,I5,5X,I5)
C
C
C
C
C     RETURN
 2    CONTINUE
      DO 204 LIST=1,NUML
      WRITE(6,500)
      WRITE(6,1)IDSYS,(ISYS(I),I=1,30),NUML,NUMS
      WRITE(6,201)NAME(LIST)
 201  FORMAT(13X,77('*')/' FOR LISTENER# ',I4,' */
     1  13X,7('*')//
     1  ' SPKR  SCORE'/)
      DO 204 ISPKR=1,NUMS
      SUM = 0.0
```

```
      DO 202 I=1,31,6
      J=I+1
202   SUM = SUM + DATA(LIST,ISPKR,I) + DATA(LIST,ISPKR,J)
      SUM = SUM/12.0
      WRITE(6,203)MSPK(LIST,ISPKR),SUM
203   FORMAT(1X,A2,1X,F7.2)
204   CONTINUE
      WRITE(6,403)
      WRITE(6,404)
      DO 209 I=1,6
209   SEND(I)=0.0
      DO 210 I=1,35,2
      J=I+1
      DO 211 K=1,NUMS
211   ARRAY(K)=DATA(LIST,K,I)
      CALL STATS(NUMS,X,S)
      SEND(1)=X
      SEND(2)=S
      DO 212 K=1,NUMS
212   ARRAY(K)=DATA(LIST,K,J)
      CALL STATS(NUMS,X,S)
      SEND(3) = X
      SEND(4) = S
      DO 213 K=1,NUMS
213   ARRAY(K)=(ARRAY(K)+DATA(LIST,K,I))/2.0
      CALL STATS(NUMS,X,S)
      SEND(5)=X
      SEND(6)=S
      CALL OUT(I,SEND)
210   CONTINUE
      DO 215 K=1,NUMS
      SUM = 0.0
      DO 214 I=1,31,6
214   SUM = SUM + DATA(LIST,K,I)
215   ARRAY(K) = SUM/6.0
      CALL STATS(NUMS,X,S)
      SEND(1)=X
      SEND(2)=S
      DO 216 K=1,NUMS
      SUM = 0.0
      DO 217 I=2,32,6
217   SUM = SUM + DATA(LIST,K,I)
216   ARRAY(K) = SUM/6.0
      CALL STATS(NUMS,X,S)
      SEND(3) = X
      SEND(4) = S
      DO 219 K=1,NUMS
      SUM = 0.0
      DO 218 I=1,31,6
      J = I+1
218   SUM = SUM + DATA(LIST,K,I) + DATA(LIST,K,J)
219   ARRAY(K) = SUM/12.0
      CALL STATS(NUMS,X,S)
      SEND(5) = X
      SEND(6) = S
      CALL OUT(36,SEND)
      WRITE(6,490)X,S
299   CONTINUE
      DO 300 ISPKR = 1,NUMS
      WRITE(6,500)
      WRITE(6,1)IDSYS,(ISYS(I),I=1,30),NUML,NUMS
      WRITE(6,301)MSPK(1,ISPKR)
301   FORMAT(12X,'*****'/' FOR SPEAKER! ',A2,' *'/
```

```
     1  12X,'*****//' LISTENER',4X,' SCORE'/)
        DO 304 LIST = 1,NUML
        SUM = 0.0
        DO 302 I=1,31,6
        J=I+1
302     SUM = SUM+DATA(LIST,ISPKR,I)+DATA(LIST,ISPKR,J)
        SUM = SUM/12.0
        WRITE(6,303)NAME(LIST),SUM
303     FORMAT(1X,I4,6X,F7.2)
304     CONTINUE
        WRITE(6,403)
        WRITE(6,404)
        DO 310 I=1,35,2
        J=I+1
        DO 311 K=1,NUML
311     ARRAY(K)=DATA(K,ISPKR,I)
        CALL STATS(NUML,X,S)
        SEND(1)=X
        SEND(2)=S
        DO 312 K=1,NUML
312     ARRAY(K)=DATA(K,ISPKR,J)
        CALL STATS(NUML,X,S)
        SEND(3)=X
        SEND(4)=S
        DO 313 K=1,NUML
313     ARRAY(K) = (ARRAY(K)+DATA(K,ISPKR,I))/2.0
        CALL STATS(NUML,X,S)
        SEND(5)=X
        SEND(6)=S
        CALL OUT(I,SEND)
310     CONTINUE
        DO 315 K=1,NUML
        SUM = 0.0
        DO 314 I=1,31,6
314     SUM = SUM + DATA(K,ISPKR,I)
315     ARRAY(K) = SUM/6.0
        CALL STATS(NUML,X,S)
        SEND(1)=X
        SEND(2)=S
        DO 316 K=1,NUML
        SUM = 0.0
        DO 317 I=2,32,6
317     SUM = SUM+DATA(K,ISPKR,I)
316     ARRAY(K)=SUM/6.0
        CALL STATS(NUML,X,S)
        SEND(3)=X
        SEND(4)=S
        DO 319 K=1,NUML
        SUM =0.0
        DO 318 I=1,31,6
        J=I+1
318     SUM = SUM+DATA(K,ISPKR,I)+DATA(K,ISPKR,J)
319     ARRAY(K)=SUM/12.0
        CALL STATS(NUML,X,S)
        SEND(5)=X
        SEND(6)=S
        CALL OUT(30,SEND)
        WRITE(6,490)X,S
        TEMP(1,ISPKR)=X
        TEMP(2,ISPKR)=S
300     CONTINUE
        WRITE(6,500)
        WRITE(6,1)IDSYS,(ISYS(I),I=1,30),NUML,NUMS
```

```
      WRITE(6,320)
320   FORMAT(' COMBINED RESULTS - STANDARD ERRORS ACROSS ',
     1 'SPEAKERS AND LISTENERS ******'//)
      WRITE(6,403)
      WRITE(6,404)
      NUMT = NUML*NUMS
      DO 321 I=1,35,2
      J=I+1
      DO 322 K=1,NUML
      DO 322 L =1,NUMS
      M=NUMS*(K-1)+L
322   ARRAY(M)=DATA(K,L,I)
      CALL STATS(NUMT,X,S)
      SEND(1)=X
      SEND(2)=S
      DO 323 K=1,NUML
      DO 323 L=1,NUMS
      M=NUMS*(K-1)+L
323   ARRAY(M)=DATA(K,L,J)
      CALL STATS(NUMT,X,S)
      SEND(3)=X
      SEND(4)=S
      DO 324 K=1,NUML
      DO 324 L=1,NUMS
      M=NUMS*(K-1)+L
      SUM = DATA(K,L,I)+DATA(K,L,J)
324   ARRAY(M)=SUM/2.0
      CALL STATS(NUMT,X,S)
      SEND(5)=X
      SEND(6)=S
      CALL OUT(I,SEND)
321   CONTINUE
      DO 325 K=1,NUML
      DO 325 L=1,NUMS
      M=NUMS*(K-1)+L
      SUM = 0.0
      DO 326 I=1,31,6
326   SUM = SUM+DATA(K,L,I)
325   ARRAY(M)=SUM/6.0
      CALL STATS(NUMT,X,S)
      SEND(1)=X
      SEND(2)=S
      DO 327 K=1,NUML
      DO 327 L=1,NUMS
      M=NUMS*(K-1)+L
      SUM=0.0
      DO 328 I=2,32,6
328   SUM = SUM + DATA(K,L,I)
327   ARRAY(M)=SUM/6.0
      CALL STATS(NUMT,X,S)
      SEND(3)=X
      SEND(4)=S
      DO 330 K=1,NUML
      DO 330 L=1,NUMS
      M=NUMS*(K-1)+L
      SUM=0.0
      DO 331 I=1,31,6
      J=I+1
331   SUM = SUM+DATA(K,L,I)+DATA(K,L,J)
330   ARRAY(M)=SUM/12.0
      CALL STATS(NUMT,X,S)
      SEND(5)=X
      SEND(6)=S
```

```
      CALL OUT(36,SEND)
      WRITE(6,400)X,S
      WRITE(6,501)(MSPK(1,J),J=1,NUMS)
      WRITE(6,502)(TEMP(1,K),K=1,NUMS)
      WRITE(6,503)(TEMP(2,K),K=1,NUMS)
501   FORMAT(//9X,9(A2,5X))
502   FORMAT(/' MEAN ',9(2X,F5.2))
503   FORMAT(/' S.E. ',9(2X,F5.2))
      NPLACE=0
      RETURN
276   FORMAT(10X,'MAIN ATTR:',18X,'PRES',7X,'ABS'//)
277   FORMAT(15X,'VOIC',23X,I2,11X,I2)
278   FORMAT(20X,'FRIC',16X,I2,11X,I2)
279   FORMAT(20X,'NON-FRIC',12X,I2,11X,I2/)
280   FORMAT(15X,'NASAL',22X,I2,11X,I2)
281   FORMAT(20X,'GRAVE',21X,I2,11X,I2)
282   FORMAT(20X,'ACUTE',21X,I2,11X,I2/)
283   FORMAT(15X,'SUSTEN',20X,I2,11X,I2)
284   FORMAT(20X,'VOICED',20X,I2,11X,I2)
285   FORMAT(20X,'UNVOICED',18X,I2,11X,I2/)
286   FORMAT(15X,'SIBIL',20X,I2,11X,I2)
287   FORMAT(15X,'GRAVENESS',21X,I2,11X,I2)
288   FORMAT(15X,'COMPACTNESS',19X,I2,11X,I2)
400   FORMAT(' DRT MEANS AND STANDARD ERRORS FOR',I3,' LISTENERS'/)
401   FORMAT(' SYSTEM UNDER TEST:  ',50A1/)
402   FORMAT(' NUMBER OF SPEAKERS =',I2/)
403   FORMAT(//' MAIN ATTRIBUTE:',12X,'PRESENT',10X,'ABSENT',
     1  12X,'TOTAL'/)
404   FORMAT(20X,3(4X,'MEAN    S.E. '))
490   FORMAT(/30X,'******************'/
     1  30X,'* MEAN = ',F6.2,' *'/
     1  13X,'TOTAL DRT SCORE: *',15X,'*'/
     1  30X,'* S.E. = ',F6.2,' *'/
     1  30X,'******************')
      END
C
C
C
C
C
      SUBROUTINE STATS(N,XMEAN,STDERR)
C
C
C
      COMMON/A/IDSYS,ISYS(50),NAME(15),NPAGE(7,2,3),
     XMSPK(15,9),MKEY,LETTER,LIST,ISPK,NUML,NUMS,ARRAY(60),IRESP(2,29),
     XDATA(12,6,36)
      X=0.0
      XN = FLOAT(N)
      DO 1 I=1,N
      X = X + ARRAY(I)
1     CONTINUE
      XMEAN = X/XN
      STDERR = 0.0
      DO 2 I=1,N
2     STDERR = STDERR + (ARRAY(I)-XMEAN)*(ARRAY(I)-XMEAN)
      STDERR = SQRT(STDERR/XN/XN)
      RETURN
      END
      SUBROUTINE OUT(N,X)
      DIMENSION X(6)
      IF(N.EQ.36)GOTO 19
      K=(N+1)/2
```

```
      IF(K.EQ.11)K=8
      IF(K.EQ.14)K=8
      IF(K.EQ.17)K=8
      IF(K.EQ.12)K=9
      IF(K.EQ.15)K=9
      IF(K.EQ.18)K=9
      IF(K.EQ.13)K=11
      IF(K.EQ.16)K=12
      GOTO(1,2,3,4,5,6,7,8,9,10,13,16),K
1     WRITE(6,405)(X(I),I=1,6)
      RETURN
2     WRITE(6,406)(X(I),I=1,6)
      RETURN
3     WRITE(6,407)(X(I),I=1,6)
      RETURN
4     WRITE(6,408)(X(I),I=1,6)
      RETURN
5     WRITE(6,409)(X(I),I=1,6)
      RETURN
6     WRITE(6,410)(X(I),I=1,6)
      RETURN
7     WRITE(6,411)(X(I),I=1,6)
      RETURN
8     WRITE(6,412)(X(I),I=1,6)
      RETURN
9     WRITE(6,413)(X(I),I=1,6)
      RETURN
10    WRITE(6,414)(X(I),I=1,6)
      RETURN
13    WRITE(6,415)(X(I),I=1,6)
      RETURN
16    WRITE(6,416)(X(I),I=1,6)
      RETURN
19    WRITE(6,417)(X(I),I=1,6)
      RETURN
405   FORMAT(3X,'VOICING',9X,3(3X,F6.2,2X,F6.2))
406   FORMAT(6X,'FRICTIONAL',4X,3(3X,F6.2,2X,F6.2))
407   FORMAT(6X,'NON-FRICTIONAL',3(3X,F6.2,2X,F6.2)/)
408   FORMAT(3X,'NASALITY',8X,3(3X,F6.2,2X,F6.2))
409   FORMAT(6X,'GRAVE',9X,3(3X,F6.2,2X,F6.2))
410   FORMAT(6X,'ACUTE',9X,3(3X,F6.2,2X,F6.2)/)
411   FORMAT(3X,'SUSTENTION',6X,3(3X,F6.2,2X,F6.2))
412   FORMAT(6X,'VOICED',8X,3(3X,F6.2,2X,F6.2))
413   FORMAT(6X,'UNVOICED',6X,3(3X,F6.2,2X,F6.2)/)
414   FORMAT(3X,'SIBILATION',6X,3(3X,F6.2,2X,F6.2))
415   FORMAT(3X,'GRAVENESS',7X,3(3X,F6.2,2X,F6.2))
416   FORMAT(3X,'COMPACTNESS',5X,3(3X,F6.2,2X,F6.2))
417   FORMAT(3X,'TOTALS',10X,3(3X,F6.2,2X,F6.2))
      END
      SUBROUTINE MATR
      COMMON/A/IDSYS,ISYS(50),NAME(15),NPAGE(7,2,3),
     XMSPK(15,9),MKEY,LETTER,LIST,ISPK,NUML,NUMS,ARRAY(60),IRESP(2,29),
     XDATA(12,6,36)
      DIMENSION XMATR(15,6),ITALK(9),ANS(2,6)
      DIMENSION DEV(15,6),VAR(15),XLM(15),SM(6),FSTAT(15)
      DIMENSION NMEL(6)
      DATA IBLNK/2H  /
C
      KKK=4
      NUMF=4
C
      DO 200 I=1,NUML
      DO 200 K=1,NUMS
```

```
      SUM=0.
      DO 202 II=1,31,6
      JJ=II+1
  202 SUM=SUM+DATA(I,K,II)+DATA(I,K,JJ)
      SUM=SUM/12.
  200 XMATR(I,K)=SUM
C
  312 CONTINUE
      DO 2002 JJJ=1,KKK
      DO 203 I=1,9
  203 ITALK(I)=IBLNK
      DO 204 I=1,NUMS
  204 ITALK(I)=MSPK(1,I)
C
      WRITE(6,108)
      WRITE(6,107)IDSYS,(ISYS(I),I=1,30),NUML,NUMS
      WRITE(6,103)
      WRITE(6,100)(ITALK(I),I=1,9)
      IF(NUMS.EQ.6)WRITE(6,1001)
      IF(NUMS.EQ.3)WRITE(6,1002)
 1001 FORMAT(1H+,49X,4HMEAN,4X,4HS.E.)
 1002 FORMAT(1H+,29X,4HMEAN,4X,4HS.E.)
      WRITE(6,102)
C
C
      DO 201 LIST=1,NUML
      DO 205 ISPK=1,NUMS
  205 ARRAY(ISPK)=XMATR(LIST,ISPK)
      CALL STATS(NUMS,X,S)
  201 WRITE(6,101)NAME(LIST),(XMATR(LIST,ISPK),ISPK=1,NUMS),X,S
      DO 206 ISPK=1,NUMS
      DO 207 LIST=1,NUML
  207 ARRAY(LIST)=XMATR(LIST,ISPK)
      CALL STATS(NUML,X,S)
      ANS(1,ISPK)=X
      ANS(2,ISPK)=S
  206 CONTINUE
      WRITE(6,104)(ANS(1,I),I=1,NUMS)
      WRITE(6,105)(ANS(2,I),I=1,NUMS)
      DO 208 ISPK=1,NUMS
      DO 208 LIST=1,NUML
      K=NUMS*(LIST-1)+ISPK
  208 ARRAY(K)=XMATR(LIST,ISPK)
      NUMT=NUMS*NUML
      CALL STATS(NUMT,X,S)
      WRITE(6,106)X,S
 2002 CONTINUE
      VHIG=0.
      WRITE(6,108)
      WRITE(6,107)IDSYS,(ISYS(I),I=1,30),NUML,NUMS
      WRITE(6,300)
  300 FORMAT(//2X,'LISTENER DEVIATIONS FROM SPEAKER MEANS'//)
      WRITE(6,103)
      WRITE(6,100)(ITALK(I),I=1,9)
      IF(NUMS.EQ.6)WRITE(6,1003)
      IF(NUMS.EQ.3)WRITE(6,1004)
 1003 FORMAT(1H+,51X,3HVAR)
 1004 FORMAT(1H+,30X,3HVAR)
      WRITE(6,102)
      XNUMS=NUMS
      XNUML=NUML
      TOTAL=XNUMS*XNUML
      DO 301 J=1,NUMS
```

```
      SUM=0.
      DO 302 I=1,NUML
  302 SUM=SUM+XMATR(I,J)
  301 SM(J)=SUM/XNUML
      DO 303 I=1,NUML
      SUM=0.
      DO 304 J=1,NUMS
  304 SUM=SUM+XMATR(I,J)
  303 XLM(I)=SUM/XNUMS
      SUM=0.
      DO 305 I=1,NUML
  305 SUM=SUM+XLM(I)
      GM=SUM/XNUML
C
      DO 306 I=1,NUML
      DO 307 J=1,NUMS
  307 DEV(I,J)=XMATR(I,J)-SM(J)
      SS=0.
      DO 308 J=1,NUMS
  308 SS=SS+DEV(I,J)*DEV(I,J)
      VAR(I)=SS/XNUMS
      IF(VAR(I).LE.VBIG)GO TO 330
      VBIG=VAR(I)
      LBIG=I
  330 WRITE(6,101)NAME(I),(DEV(I,J),J=1,NUMS),VAR(I)
C
      CALL OUTLR(XMATR,NUML,NUMS,I,F,FSTAT)
C
  306 CONTINUE
C
      KMP=NUML-NUMS-1
      WRITE(6,400)NUMS,KMP
  400 FORMAT(//' F STATISTIC FOR TESTING EACH LISTENER
     X AS AN OUT-LYER'//' COMPARE WITH F PERCENTAGE POINT
     X WITH DF=',I3,' AND',I2/)
      WRITE(6,401)
  401 FORMAT(' LIST.    F'/)
      DO 402 I=1,NUML
      WRITE(6,403)NAME(I),FSTAT(I)
  403 FORMAT(I5,F8.3)
  402 CONTINUE
      IF(NUML.LE.8)STOP
      NUME=NUME+1
      NMEL(NUME)=NAME(LBIG)
      WRITE(6,500)(NMEL(I),I=1,NUME)
  500 FORMAT(/1X,'WILL ELIM:',8I6)
      IF(LBIG.EQ.NUML)GO TO 310
      DO 311 I=LBIG,NUML
      IP1=I+1
      NAME(I)=NAME(IP1)
      DO 311 J=1,NUMS
  311 XMATR(I,J)=XMATR(IP1,J)
  310 NUML=NUML-1
      KKK=1
      GO TO 312
CCCCCCCCCCC
CCCCCCCCCCC
CCCCCCCC
  100 FORMAT(5X,9(3X,A2,2X))
  101 FORMAT(/1X,I4,1X,11(2X,F5.2)/)
  102 FORMAT(' LIST.')
  103 FORMAT(8X,'SPEAKERS'/)
  104 FORMAT(/' MEAN',1X,11(2X,F5.2)/)
```

```
 105     FORMAT(/' S.E.',1X,11(2X,F5.2)/)
 106     FORMAT(/30X,17('*')/
     X30X,'* MEAN = ',F6.2,' *'/
     X13X,'TOTAL ORT SCORE: *',15X,'*'/
     X30X,'* S.E. = ',F6.2,' *'/
     X30X,17('*'))
 107     FORMAT(' SYSTEM ',I4,3X,30A2//
     X5X,'NUMBER LISTENERS =',I3/
     X5X,'NUMBER SPEAKERS =',I3//)
 108     FORMAT(1H1,' ')
C
C
        END
        SUBROUTINE STATS(N,XMEAN,STDERR)
        COMMON/A/IOSYS,ISYS(50),NAME(15),NPAGE(7,2,3),
     XMSPK(15,9),MKEY,LETTER,LIST,ISPK,NUMI,NUMS,ARRAY(60),IRESP(2,29),
     XDATA(12,6,36)
C
        X=0.
        XN=FLOAT(N)
        DO 1 I=1,N
        X=X+ARRAY(I)
  1     CONTINUE
        XMEAN=X/XN
        STDERR=0.
        DO 2 I=1,N
  2     STDERR=STDERR+(ARRAY(I)-XMEAN)*(ARRAY(I)-XMEAN)
        STDERR=SQRT(STDERR/XN/XN)
        RETURN
        END
C
C
        SUBROUTINE OUTLR(DATA,N,IP,IOUT,F,FSTAT)
        DIMENSION S(6,6),DATA(15,6),XMEAN(6),TEMP(6),SINV(6,6)
        DIMENSION FSTAT(15)
C
        P=IP
        K=N-1
        XK=K
        KMP=K-(K-IP)
        KSQ=IP*(K*K-1)
        XKMP=KMP
        XKSQ=KSQ
        RATIO=XKMP/XKSQ
        DO 100 I=1,IP
 100    XMEAN(I)=0.
C
        DO 101 J=1,IP
        DO 101 I=1,N
        IF(I.EQ.IOUT)GO TO 101
        XMEAN(J)=XMEAN(J)+DATA(I,J)
 101    CONTINUE
        DO 102 J=1,IP
 102    XMEAN(J)=XMEAN(J)/XK
C
        XKM=K-1
C
        DO 103 I=1,IP
        TEMP(I)=0.
        DO 103 J=1,IP
 103    S(I,J)=0.
        II=0
        DO 104 I=1,N
```

```
      IF(I.EQ.IOUT)GO TO 104
      DO 105 J=1,IP
105   TEMP(J)=DATA(I,J)-XMEAN(J)
      DO 106 J=1,IP
      DO 106 JJ=1,IP
106   S(J,JJ)=S(J,JJ)+TEMP(J)*TEMP(JJ)
104   CONTINUE
      DO 107 I=1,IP
      DO 107 J=1,IP
107   S(I,J)=S(I,J)/XKM
C
      CALL INVERS(S,SINV,IP)
C
      DO 111 J=1,IP
111   TEMP(J)=DATA(IOUT,J)-XMEAN(J)
C
C
      D=0.
      DO 112 I=1,IP
      DO 112 J=1,IP
112   D=D+TEMP(I)*SINV(I,J)*TEMP(J)
      KMP=K-IP
      FSTAT(IOUT)=RATIO*D
      RETURN
      END
C
C
C ************** SUBROUTINE INVERSE ****************
C
C
      SUBROUTINE INVERS(A,B,N)
      DIMENSION A(6,6),B(6,6)
      EPS=.0001
      DO 6 I=1,N
      DO 5 J=1,N
      IF(I-J)4,3,4
3     B(I,J)=1.0
      GOTO 5
4     B(I,J)=0.0
5     CONTINUE
6     CONTINUE
      DEL=1.0
      DO 45 K=1,N
      IF(K-N)12,30,30
12    IMAX=K
      AMAX=ABS(A(K,K))
      KP1=K+1
      DO 20 I=KP1,N
      DIFF=AMAX-ABS(A(I,K))
      IF(DIFF)15,20,20
15    IMAX=I
      AMAX=ABS(A(I,K))
20    CONTINUE
      IF(IMAX-K)25,30,25
25    DO 29 J=1,N
      ATMP=A(IMAX,J)
      A(IMAX,J)=A(K,J)
      A(K,J)=ATMP
      BTMP=B(IMAX,J)
      B(IMAX,J)=B(K,J)
29    B(K,J)=BTMP
      DEL=-DEL
30    CONTINUE
```

```
      DIFF=ABS(A(K,K)-EPS)
      IF(DIFF)93,93,35
35    DET=A(K,K)*DET
      DIV=A(K,K)
      DO 38 J=1,N
      A(K,J)=A(K,J)/DIV
38    B(K,J)=B(K,J)/DIV
      DO 43 I=1,N
      AMULT=A(I,K)
      IF(I-K)39,43,39
39    DO 42 J=1,N
      A(I,J)=A(I,J)-AMULT*A(K,J)
42    B(I,J)=B(I,J)-AMULT*B(K,J)
43    CONTINUE
45    CONTINUE
90    RETURN
93    WRITE(6,113)
113   FORMAT(/'* SINGULAR MATRIX *'/)
      END  0
```

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR LISTENER: 1277

SPKR SCORE

BV 89.58
JE 89.58
RO 93.75

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	87.50	5.89	93.75	2.95
FRICTIONAL	100.00	0.00	83.33	6.80	91.67	3.40
NON-FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NASALITY	95.83	3.40	100.00	0.00	97.92	1.70
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	91.67	6.80	100.00	0.00	95.83	3.40
SUSTENTION	83.33	6.80	58.33	3.40	70.83	4.50
VOICED	75.00	11.79	50.00	20.41	62.50	11.79
UNVOICED	91.67	6.80	66.67	13.61	79.17	3.40
SIBILATION	95.83	3.40	100.00	0.00	97.92	1.70
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	91.67	6.80	100.00	0.00	95.83	3.40
GRAVENESS	91.67	3.40	79.17	9.00	85.42	3.40
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	83.33	6.80	58.33	18.00	70.83	6.80
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	94.44	2.27	87.50	0.00	90.97	1.13

TOTAL DRT SCORE:

MEAN =	90.97
S.E. =	1.13

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR LISTENER: 3345

SPKR	SCORE
BV	88.54
JE	82.29
RD	93.75

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	95.83	3.40	91.67	6.80	93.75	5.18
FRICTIONAL	100.00	0.00	100.00	0.00	100.00	0.00
NON-FRICTIONAL	91.67	6.80	83.33	13.61	87.50	10.21
NASALITY	100.00	0.00	95.83	3.40	97.92	1.70
GRAVE	100.00	0.00	91.67	6.80	95.83	3.40
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	58.33	12.27	75.00	5.89	66.67	8.51
VOICED	50.00	11.79	75.00	11.79	62.50	10.21
UNVOICED	66.67	10.00	75.00	11.79	70.83	6.80
SIBILATION	79.17	9.00	100.00	0.00	89.58	4.50
VOICED	75.00	11.79	100.00	0.00	87.50	5.89
UNVOICED	83.33	13.61	100.00	0.00	91.67	6.80
GRAVENESS	91.67	3.40	70.83	3.40	81.25	2.95
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	83.33	6.80	41.67	6.80	62.50	5.89
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	87.50	3.93	88.89	1.90	88.19	2.70

TOTAL DRT SCORE:

MEAN =	88.19
S.E. =	2.70

SYSTEM TESTED: 1194 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

****
FOR LISTENER: 4426 *
****

SPKR SCORE

BV 88.54
JE 88.21
RO 92.71

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	91.67	6.80	95.83	3.40
FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NON-FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	58.33	9.00	62.50	5.89	60.42	7.41
VOICED	50.00	20.41	41.67	18.00	45.83	14.83
UNVOICED	66.67	13.61	83.33	13.61	75.00	0.00
SIBILATION	66.67	12.27	100.00	0.00	83.33	6.13
VOICED	83.33	6.80	100.00	0.00	91.67	3.40
UNVOICED	50.00	20.41	100.00	0.00	75.00	10.21
GRAVENESS	91.67	6.80	70.17	3.40	85.42	1.70
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	83.33	13.61	58.33	6.80	70.83	3.40
COMPACTNESS	95.83	3.40	100.00	0.00	97.92	1.70
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	91.67	6.80	100.00	0.00	95.83	3.40
TOTALS	85.42	4.50	88.89	1.50	87.15	3.00

TOTAL DRT SCORE:

****
* MEAN = 87.15 *
* *
* S.E. = 3.00 *
****

SYSTEM TESTED: 1144 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

****
FOR LISTENER: 5345 *
****

SPKR	SCORE
BV	87.50
JE	84.37
RU	94.79

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	91.67	6.80	95.83	3.40
FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NON-FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	75.00	5.80	66.67	9.00	70.83	6.80
VOICED	66.67	13.61	50.33	18.00	62.50	15.59
UNVOICED	83.33	6.80	75.00	11.79	79.17	3.40
SIBILATION	87.50	0.00	100.00	0.00	93.75	0.00
VOICED	83.33	6.80	100.00	0.00	91.67	3.40
UNVOICED	91.67	6.80	100.00	0.00	95.83	3.40
GRAVENESS	66.67	9.00	79.17	3.40	72.92	6.13
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	33.33	18.00	58.33	6.80	45.83	12.27
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	88.10	2.47	89.58	2.60	88.89	2.52

TOTAL DRT SCORE:

****
* MEAN = 88.89 *
* *
* S.E. = 2.52 *
****

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR LISTENER: 5406

SPKR SCORE

AV 86.46
JE 88.54
RD 92.62

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	83.33	0.00	91.67	4.50
FRICTIONAL	100.00	0.00	83.33	6.80	91.67	3.40
NON-FRICTIONAL	100.00	0.00	83.33	13.61	91.67	6.80
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	79.17	9.00	58.33	6.80	68.75	2.95
VOICED	86.67	13.61	50.00	0.00	58.33	6.80
UNVOICED	91.67	6.80	66.67	13.61	79.17	3.40
SIBILATION	95.83	3.40	100.00	0.00	97.92	1.70
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	91.67	6.80	100.00	0.00	95.83	3.40
GRAVENESS	66.67	3.40	79.17	9.00	72.92	6.13
VOICED	91.67	6.80	100.00	0.00	95.83	3.40
UNVOICED	41.67	6.80	58.33	18.00	50.00	11.79
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	90.28	1.50	86.81	1.98	88.54	0.98

TOTAL DRT SCORE:

MEAN	88.54
S.E.	0.98

SYSTEM TESTED: 1134 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

****
FOR LISTENER: 6004 *
****

SPKR	SCORE
BV	89.58
JE	87.50
RO	95.83

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	95.83	3.40	97.92	1.70
FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NON-FRICTIONAL	100.00	0.00	100.00	0.00	100.00	0.00
NASALITY	100.00	0.00	95.83	3.40	97.92	1.70
GRAVE	100.00	0.00	91.67	6.80	95.83	3.40
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	70.17	0.00	70.83	3.40	75.00	5.80
VOICED	58.33	18.00	75.00	11.79	66.67	13.61
UNVOICED	100.00	0.00	66.67	13.61	83.33	6.80
SIBILATION	87.50	5.80	100.00	0.00	93.75	2.95
VOICED	91.67	6.80	100.00	0.00	95.83	3.40
UNVOICED	83.33	13.61	100.00	0.00	91.67	6.80
GRAVENESS	91.67	6.80	70.83	3.40	81.25	2.95
VOICED	91.67	6.80	100.00	0.00	95.83	3.40
UNVOICED	91.67	6.80	41.67	6.80	66.67	3.40
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	93.06	3.00	88.89	1.13	90.97	2.04

TOTAL DRT SCORE:

MEAN =	90.97
S.E. =	2.04

SYSTEM TESTED: 1134 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR LISTENER: AH54 *

SPKR SCORE

AV 88.54
JE 89.21
RO 92.71

MAIN ATTRIBUTE:	PRESENT MEAN	PRESENT S.E.	ABSENT MEAN	ABSENT S.E.	TOTAL MEAN	TOTAL S.E.
VOICING	91.67	6.80	83.33	6.80	87.50	0.00
FRICTIONAL	91.67	6.80	66.67	13.61	79.17	3.40
NON-FRICTIONAL	91.67	6.80	100.00	0.00	95.83	3.40
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	75.00	15.59	54.17	14.83	64.58	14.83
VOICED	75.00	11.79	33.33	24.53	54.17	18.00
UNVOICED	75.00	20.41	75.00	11.79	75.00	11.79
SIBILATION	91.67	3.40	100.00	0.00	95.83	1.70
VOICED	91.67	6.80	100.00	0.00	95.83	3.40
UNVOICED	91.67	6.80	100.00	0.00	95.83	3.40
GRAVENESS	75.00	5.80	79.17	6.80	77.08	1.70
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	50.00	11.79	58.33	13.61	54.17	3.40
COMPACTNESS	100.00	0.00	95.83	3.40	97.92	1.70
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	91.67	6.80	95.83	3.40
TOTALS	88.80	5.04	85.42	0.00	87.15	3.00

TOTAL DRT SCORE:

* MEAN = 87.15 *
* S.E. = 3.00 *

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

****
FOR LISTENER: 8066 *
****

SPKR	SCORE
BV	91.67
JE	90.62
RD	91.67

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	95.83	3.40	97.92	1.70
FRICTIONAL	100.00	0.00	100.00	0.00	100.00	0.00
NON-FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NASALITY	100.00	0.00	95.83	3.40	97.92	1.70
GRAVE	100.00	0.00	91.67	6.80	95.83	3.40
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	91.67	3.40	75.00	0.00	83.33	1.70
VOICED	83.33	6.80	83.33	13.61	83.33	9.00
UNVOICED	100.00	0.00	66.67	13.61	83.33	6.80
SIBILATION	79.17	3.40	95.83	3.40	87.50	2.95
VOICED	83.33	6.80	100.00	0.00	91.67	3.40
UNVOICED	75.00	11.79	91.67	6.80	83.33	6.80
GRAVENESS	87.50	5.80	75.00	10.21	81.25	2.95
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	75.00	11.79	50.00	20.41	62.50	5.89
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	93.06	1.50	89.58	0.98	91.32	0.28

TOTAL DRT SCORE:

MEAN =	91.32
S.E. =	0.28

SYSTEM TESTED: 1144 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

****
FOR LISTENER: 9339 *
****

SPKR	SCORE
BV	84.37
JE	87.50
RD	97.92

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	91.67	6.80	95.83	3.40
FRICTIONAL	100.00	0.00	100.00	0.00	100.00	0.00
NON-FRICTIONAL	100.00	0.00	83.33	13.61	91.67	6.80
NASALITY	95.83	3.40	100.00	0.00	97.92	1.70
GRAVE	91.67	6.80	100.00	0.00	95.83	3.40
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	75.00	11.79	66.67	13.61	70.83	12.27
VOICED	75.00	11.79	50.00	23.57	62.50	15.59
UNVOICED	75.00	11.79	83.33	13.61	79.17	12.27
SIBILATION	95.83	3.40	100.00	0.00	97.92	1.70
VOICED	91.67	6.80	100.00	0.00	95.83	3.40
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
GRAVENESS	79.17	9.00	75.00	5.89	77.08	4.58
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	58.33	18.00	50.00	11.79	54.17	9.00
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	90.97	3.07	88.89	2.84	89.93	3.34

TOTAL DRT SCORE:

MEAN =	89.93
S.E. =	3.34

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

****
FOR LISTENER: 0463 *
****

SPKR	SCORE
BV	91.67
JE	98.62
RD	99.62

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	95.83	3.40	95.83	3.40	95.83	1.70
FRICTIONAL	100.00	0.00	91.67	6.80	95.83	3.40
NON-FRICTIONAL	91.67	6.80	100.00	0.00	95.83	3.40
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	75.00	10.21	79.17	3.40	77.08	4.50
VOICED	66.67	18.00	75.00	11.79	70.83	6.80
UNVOICED	83.33	13.61	83.33	6.80	83.33	3.40
SIBILATION	95.83	3.40	95.83	3.40	95.83	1.70
VOICED	100.00	0.00	91.67	6.80	95.83	3.40
UNVOICED	91.67	6.80	100.00	0.00	95.83	3.40
GRAVENESS	79.17	3.40	75.00	5.89	77.08	4.50
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	58.33	6.80	50.00	11.79	54.17	9.00
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	98.97	2.04	98.97	2.27	98.97	0.28

TOTAL DRT SCORE:

MEAN	98.97
S.E.	0.28

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR LISTENER: 9557

SPKR	SCORE
BV	89.58
JE	89.58
RD	92.71

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	83.33	3.40	91.67	1.70
FRICTIONAL	100.00	0.00	83.33	6.80	91.67	3.40
NON-FRICTIONAL	100.00	0.00	83.33	6.80	91.67	3.40
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	79.17	9.00	66.67	3.40	72.92	6.13
VOICED	58.33	18.00	58.33	13.61	58.33	14.83
UNVOICED	100.00	0.00	75.00	11.79	87.50	5.89
SIBILATION	91.67	3.40	100.00	0.00	95.83	1.70
VOICED	91.67	6.80	100.00	0.00	95.83	3.40
UNVOICED	91.67	6.80	100.00	0.00	95.83	3.40
GRAVENESS	79.17	3.40	87.50	5.89	83.33	1.70
VOICED	91.67	6.80	100.00	0.00	95.83	3.40
UNVOICED	66.67	13.61	75.00	11.79	70.83	3.40
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	91.67	2.60	89.58	0.00	90.62	0.85

TOTAL DRT SCORE: MEAN = 90.62, S.E. = 0.85

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR SPEAKER: JE

LISTENER	SCORE
1277	89.58
3345	82.20
4026	80.21
5345	84.37
5406	88.54
6004	87.50
8854	80.21
8066	90.62
9339	87.50
9463	90.62
9567	89.58

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	95.45	2.42	81.82	3.36	88.64	1.35
FRICTIONAL	97.73	2.17	88.64	3.75	93.18	1.88
NON-FRICTIONAL	93.18	3.36	75.00	5.57	84.09	2.83
NASALITY	100.00	0.00	96.59	1.88	98.30	0.84
GRAVE	100.00	0.00	93.18	3.36	96.59	1.68
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	61.36	4.94	61.36	4.67	61.36	4.00
VOICED	54.55	5.40	25.00	7.87	39.77	5.04
UNVOICED	68.18	7.03	97.73	2.17	82.95	4.62
SIBILATION	79.55	4.80	100.00	0.00	89.77	2.48
VOICED	93.18	3.36	100.00	0.00	96.59	1.68
UNVOICED	65.91	8.05	100.00	0.00	82.95	4.82
GRAVENESS	73.86	3.30	88.64	2.99	81.25	2.54
VOICED	97.73	2.17	100.00	0.00	98.86	1.08
UNVOICED	50.00	7.19	77.27	5.97	63.64	4.94
COMPACTNESS	100.00	0.00	98.86	1.08	99.43	0.54
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	97.73	2.17	98.86	1.08
TOTALS	85.24	1.69	87.88	0.96	86.46	1.15

TOTAL DRT SCORE:

MEAN =	86.46
S.E. =	1.15

SYSTEM TESTED: 1144 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR SPEAKER: BV *

LISTENER	SCORE
1277	89.58
3345	88.54
4026	88.54
5345	87.50
5406	86.46
6004	89.58
6854	88.54
8066	91.67
9339	84.37
9463	91.67
9557	89.58

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	94.32	2.47	97.16	1.24
FRICTIONAL	100.00	0.00	88.64	4.94	94.32	2.47
NON-FRICTIONAL	100.00	0.00	100.00	0.00	100.00	0.00
NASALITY	97.73	1.45	100.00	0.00	98.86	0.73
GRAVE	97.73	2.17	100.00	0.00	98.86	1.08
ACUTE	97.73	2.17	100.00	0.00	98.86	1.08
SUSTENTION	69.32	3.72	61.36	3.39	65.34	2.46
VOICED	45.45	5.40	70.45	5.40	57.95	3.32
UNVOICED	93.18	4.65	52.27	2.17	72.73	2.70
SIBILATION	88.64	2.52	100.00	0.00	94.32	1.26
VOICED	79.55	4.33	100.00	0.00	89.77	2.17
UNVOICED	97.73	2.17	100.00	0.00	98.86	1.08
GRAVENESS	81.82	4.85	72.73	2.70	77.27	2.31
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	83.64	8.11	45.45	5.40	64.55	4.62
COMPACTNESS	98.86	1.08	100.00	0.00	99.43	0.54
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	97.73	2.17	100.00	0.00	98.86	1.08
TOTALS	89.39	0.82	88.07	0.81	88.73	0.61

TOTAL ORT SCORE: * MEAN = 88.73 * S.E. = 0.61 *

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

FOR SPEAKER: RD

LISTENER	SCORE
1277	93.75
3345	93.75
4029	92.71
5365	94.79
5496	90.62
6094	95.83
6854	92.71
8065	91.67
9339	97.92
9463	90.62
9557	92.71

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	100.00	0.00	94.32	2.95	97.16	1.47
FRICTIONAL	100.00	0.00	90.91	4.85	95.45	2.42
NON-FRICTIONAL	100.00	0.00	97.73	2.17	98.86	1.08
NASALITY	100.00	0.00	100.00	0.00	100.00	0.00
GRAVE	100.00	0.00	100.00	0.00	100.00	0.00
ACUTE	100.00	0.00	100.00	0.00	100.00	0.00
SUSTENTION	95.45	2.42	77.27	3.88	86.36	2.10
VOICED	97.73	2.17	81.82	5.65	89.77	2.70
UNVOICED	93.18	4.65	72.73	5.97	82.95	2.91
SIBILATION	95.45	2.42	97.73	1.45	96.59	1.68
VOICED	97.73	2.17	97.73	2.17	97.73	1.45
UNVOICED	93.18	3.36	97.73	2.17	95.45	2.42
GRAVENESS	89.77	3.53	70.45	2.42	80.11	2.10
VOICED	95.45	2.01	100.00	0.00	97.73	1.45
UNVOICED	84.09	5.81	40.91	4.85	62.50	3.94
COMPACTNESS	100.00	0.00	100.00	0.00	100.00	0.00
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	100.00	0.00	100.00	0.00	100.00	0.00
TOTALS	96.78	0.73	89.96	1.83	93.37	0.63

TOTAL DRT SCORE:

MEAN	93.37
S.E.	0.63

SYSTEM TESTED: 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

COMBINED RESULTS - STANDARD ERRORS ACROSS SPEAKERS AND LISTENERS ******

MAIN ATTRIBUTE:	PRESENT		ABSENT		TOTAL	
	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
VOICING	98.48	0.89	90.15	1.99	94.32	1.05
FRICTIONAL	99.24	0.75	89.39	2.63	94.32	1.32
NON-FRICTIONAL	97.73	1.25	90.91	2.80	94.32	1.62
NASALITY	99.24	0.52	98.86	0.63	99.05	0.39
GRAVE	99.24	0.75	97.73	1.25	98.48	0.71
ACUTE	99.24	0.75	100.00	0.00	99.62	0.37
SUSTENTION	75.38	3.37	66.67	2.66	71.02	2.57
VOICED	85.91	4.77	59.09	5.65	72.50	4.22
UNVOICED	84.85	4.00	74.24	3.93	79.55	2.20
SIBILATION	87.88	2.30	99.24	0.52	93.56	1.18
VOICED	90.15	2.38	99.24	0.75	94.70	1.20
UNVOICED	85.61	3.87	99.24	0.75	92.42	2.00
GRAVENESS	81.82	2.40	77.27	2.11	79.55	1.37
VOICED	97.73	1.25	100.00	0.00	98.86	0.63
UNVOICED	65.91	4.77	54.55	4.21	60.23	2.70
COMPACTNESS	99.62	0.37	99.62	0.37	99.62	0.26
VOICED	100.00	0.00	100.00	0.00	100.00	0.00
UNVOICED	99.24	0.75	99.24	0.75	99.24	0.52
TOTALS	90.40	1.06	88.64	0.57	89.52	0.70

TOTAL DRT SCORE:

MEAN =	89.52
S.E. =	0.70

	BV	JF	RD
MEAN	88.73	86.46	93.37
S.E.	0.61	1.15	0.63

SYSTEM 1104 16-DEC-77 PROBE 1

NUMBER LISTENERS = 11
NUMBER SPEAKERS = 3

SPEAKERS

LIST.	BV	JE	RD	MEAN	S.E.
1277	89.58	89.58	93.75	90.97	1.13
3345	88.54	82.29	93.75	88.19	2.70
4026	88.54	88.21	92.71	87.15	3.00
5345	87.50	84.37	94.79	88.80	2.52
5406	86.46	88.54	90.62	88.54	0.98
6004	89.58	87.50	95.83	90.97	2.04
6854	88.54	88.21	92.71	87.15	3.00
8066	91.67	90.62	91.67	91.32	0.28
9339	84.37	87.50	97.92	89.93	3.34
9463	91.67	94.62	90.62	90.97	0.28
9557	89.58	89.58	92.71	90.62	0.85
MEAN	88.73	86.46	93.37		
S.E.	0.61	1.15	0.63		

TOTAL DRT SCORE:

****
* MEAN = 89.52 *
* *
* S.E. = 0.70 *
****

Appendix D

Use of Listeners and Behavioral Controls in the In-House Diagnostic Rhyme Test Evaluation

Lt. John J. Bowen
Speech Processing Lab
Hanscom AFB, Massachusetts
5 November 1976

D1. INTRODUCTION

The purpose of this report is to review the behavioral aspects of handling listeners for an in-house evaluation capability of the Diagnostic Rhyme Test.

The Diagnostic Rhyme Test (DRT) uses a group of trained listeners involved in a speech discrimination task. The test is designed to compare speech intelligibility between voice communication systems; digital voice processers in this case. The comparison is based upon the listeners' reception, recognition, association, and response of the processed stimulus. Since the validity of the DRT depends on human behavioral processes, which are variable from one listener subject to the next, the use of test controls to minimize these individual variables should improve the consistency and reliability of test results.

The test controls covered in this report will include the experimental effects of the test situation. Experimental effects are the sum of variables introduced into

the test situation by the test administrator, the test subjects, and the test environment itself. A brief section on listener selection and preparation will be included also. Continued research is needed in the areas of listener training and performance tracking to improve the control of consistent results. The report will close with conclusions and recommendations on the handling of listeners for in-house DRT evaluations.

D2. EXPERIMENTAL EFFECTS

As mentioned previously, experimental effects are the summation of all the outside variables contributed by the test administrator, subjects, and environment which contribute to the biasing of the test results. Ideally, a test should measure only those characteristics intended to be measured. Differences among individuals and environments however, can influence and alter test results. If controls can be placed upon the test situation, experimental or test effects can be minimized.

D2.1 Administrator Effects

From research in experimental design and testing, Rosenthal[1] concludes that a variety of biosocial, psychosocial and social psychological factors which interact between the test administrator and his subjects can effect the subjects' behavior and response. Physical characteristics such as age, sex, race, etc. and personality characteristics such as anxiety, hostility, warmth, dominance, etc. can alter the way a subject responds to the administrator and the test itself. The nature of the DRT however, tends to minimize administrator effects. After the initial training period, the listener subjects know how the test is administered and what the administrator expects of them. When a series of DRTs are being conducted, only one administrator should give the test. It is possible that listener responses could be influenced by a change of test administrators in a test.

The test administrator can influence subjects very easily in the instructions he gives them, according to Rosenthal[1]. He also points out that a test of simple data collection can be biased by the experimentor or administrator.[1] The administrator must be careful not to tell the listeners anything which could influence their responses. Voiers said that the listeners should not be told their test scores or should never be told to try harder on one test than others.[2] Listeners should not be told how many tests are left in a series or how much longer they have until the end of a test. The administrator should never give a subject any doubt that he may fail to be a good listener or that he will be removed from the program if he cannot

1. Rosenthal, R. (1966) Experimental Effects in Behavioral Research, Appleton-Century-Crofts, New York.
2. Interview with W. D. Voiers on 28 Sept 1976 at Dynastat, Austin, Texas.

perform adequately. Any such instructions could influence a listener's motivation or attention and cause inconsistent, and thus, unreliable performance.

The best method to control administrator effects is to develop and use standardized procedures for the administration of the DRT.

D2.2 Environmental Effects

Environmental effects are all physical variables present in the test situation which can affect a subject's response. Environmental effects include the comfortability of the test room, temperature, lighting, quietness distractions, etc. A change in one of these variables can decrease a subject's attention to the task and affect the subject's response.

If the environment is kept constant, the listener will know what to expect and will be able to keep his attention focused on listening. Before the test starts, the administrator should insure that the shades are down in the test room, the partitions between the booths are drawn, distractions are removed from the room, headphones work properly, volume is adjusted comfortably, room temperature is comfortable, and that listeners are supplied with the necessary pens and answer sheets. Voiers[3] says the DRT is insensitive to volume level but he uses an average vowel peak level of 80 db SPL in his tests. Comfortable room temperature for working is between 70 and 74 degrees. Precautions should be taken to insure that all test booklets are complete. Speaker tapes should be introduced and started the same way so the listeners are not taken by surprise when the tape begins. With the presentation of all the testsstandardized, the listeners will not have to worry about distractions which would influence their attention and response.

D2.3 Subject/Listener Effects

Subject effects can be the most variable of the three effects in a test situation. Personality differences among individuals cause them to respond differently in the test situation. The number of speakers and listeners in the DRT tend to minimize listener effects. Controls on listeners' motivation, attention, and expectancies should increase test reliability although studies have not been performed to support this hypothesis.

Listeners' motivation and attention will be discussed as part of listener effects. Rosenthal[1] proposes that individuals who volunteer for studies have three aims or motives which vary among individuals. These aims will also be discussed in this section regarding their impact on listener effects.

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3. Voiers, W. D. (1967) Performance Evaluation of Speech Processing Devices, III. Diagnostic Evaluation of Speech Intelligibility, Final Report, Contract No. AF19(628)4987.

D2.4 Motivation

Individuals must be properly motivated to do a task or they will not do it well. Subjects can find both extrinsic and intrinsic motivation in a task like the DRT listener program. Extrinsic motivation includes pay or recognition. For example, letters of appreciation can be sent to the listeners' supervisors. Intrinsic rewards derive from a personal sense of satisfaction, accomplishment, or providing a useful service. Past volunteer listeners have expressed a feeling of high self-satisfaction in participating in the program. Motivation should not be a problem in the in-house DRT program.

D2.5 Attention

Span of attention can vary from one listener to the next. Listeners should understand that they should try to pay an equal amount of attention throughout tests. Listeners who try harder on some tests than others will yield inconsistent results.

Attention is largely a variable of time. Swets and Kristofferson[4] point out that there are conflicting opinions as to the decrement of word identification performance vs time. Baker says that the "auditory sense is relatively slow to fatigue".[5]

Woodworth and Schlosberg[6] found that subjects may experience "blocks" in a mental task. Blocks are defined as a person's momentary inability to focus attention. They are involuntary rest periods which delay the onset of fatigue. Rest periods should be used in a test to prevent blocks from occurring since they could cause unwanted variations in test performance.

Voiers uses two groups of listeners and alternates the groups in 20-min work/20 min rest periods for his DRT listeners. He uses 3 to 4-hr sessions.

In-house studies have shown that sets of 20 min work/10 min rest/20 min work periods are most efficient for test with one group of listeners. A minimum of at least 15 min break should be given between these sets.

D2.6 Three Aims of Test Subjects

As was mentioned in the introduction of this section of the report, Rosenthal suggests that there are three reasons or aims of people who volunteer for studies or tests.[1] These three aims are related to subject effects upon a test. These aims should be satisfied to minimize the individuals' effects upon the test.

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4. Swets, J.A., and Kristofferson, A.B. (1970) Attention, Annual Review of Psychology, 21:339-366.
5. Baker, L.M. (1960) General Experimental Psychology, Oxford University Press, New York.
6. Woodworth, R.J., and Scholsberg, H. (1965) Experimental Psychology revised, Holt, Rinehart and Winston, Inc., New York.

First, test subjects expect to receive a reward for participating in the study. The different types of extrinsic and intrinsic rewards and their effects have been discussed previously under the topic of subject motivation.

Second, test subjects are usually interested in discovering the rationale behind the test. In some studies, the administrator does not want the subjects to know what they are being tested on, so he uses a blind; a false front for the test. Voiers[3] says that familiarity with the DRT does not affect the test. To satisfy the listeners' interest in discovering the rationale of the test, give them a brief explanation of the purpose of the DRT. A summary of voice processers and how the DRT is used to evaluate intelligibility should satisfy the listeners' curiosity and may even develop in them more interest in the program.

The third aim of a subject in a test is to represent himself in a favorable light to the administrator. Subjects are usually curious about their performance. Voiers does not give the test results to his listeners since it could bias later responses. Subjects also try to conform to the expectations of the experimentor, which could lead to biasing through experimentor effects if the administrator is not careful. To solve this problem for the listeners, the administrator should encourage the listeners by recognizing their efforts. He can assure them and show appreciation without giving them the test results. Rosenthal[1] says that a "self-fulfilling prophecy" works on test subjects. If the administrator does not give the listeners any reasons why they would fail as good listeners, and assures them that they are performing well, they should not worry about how they are performing. This, in turn, should minimize any effects due to the listeners doubting their performance.

D3. LISTENER PREPARATION

This section will briefly discuss some aspects of listener selection and use of listeners in the DRT.

Since the DRT is a speech discrimination task, subjects must pass certain hearing tests before they can become listeners in the program. First, the subject must have normal hearing as determined by an audiometer test. Voiers uses a range of 250 to 8000 Hz.[7] Second, the subject must be able to discriminate between the present and absent states of all six voice attributes. Voiers et al found that hearing impairment is not unidimensional[8] and may go beyond simple tone reception. Different aspects of speech discrimination performance are affected depending on

7. Voiers, W. D. (1969) The Effects of Masking Voices on the Apprehensibility of Six Consonant Attributes, Scientific Report No. 1, AFCRL Contract No. AF19(628)-5883.

8. Voiers, W. D., Sharpley, A. D., and Hehmsoth, C. J. (1973) Research on Diagnostic Evaluation of Speech Intelligibility, Final Report, AFCRL Contract No. F19628-70-C-0182.

the degree and nature of the hearing impairment.[8] This aspect of hearing impairment can be determined by checking the performance of trainee listeners over a control DRT tape. Performance in each voice attribute should level out after a period of practice. Erratic performance on any attribute would indicate a hearing impairment in that individual and he should not be used as a listener. Further tests need to be performed in this area however, since it is unknown how long it takes the average listener to find a consistent level of performance in all attributes. Answers to this question would define the training period for new listeners and would discriminate between good and bad listeners.

After a pool of listeners is established and you are ready to test, trained listeners need a warm-up test before each session of DRTs. Voiers says two speaker lists prove enough warm-up to get the listeners reaccustomed to the DRT.[3] In-house tests have supported this finding. The warm-up lists should not be the same lists which are to be evaluated in the test.

During each DRT session, each listener should be tested to make sure he is performing satisfactorily. Responses from a listener who is under emotional stress, tired, etc. during one session will differ from his normal performance. If this occurs, the listeners' results should not be used in that evaluation. Since eight listeners are used in the DRT, ten listeners should be tested to allow for two sets of results to be discarded for the preceeding reason. A control tape, played once each session, can be used to track the listeners' performance for that day and compare it to their standard performance. Research is necessary in this area to establish criteria on acceptable performance limits for listeners.

D4. CONCLUSIONS AND RECOMMENDATIONS

The DRT is designed so as to minimize experimental effects. The precautions suggested previously in this report, are an aid to insure experimental effects are minimized. The test administrator should be aware of the influence he has on a test, even the DRT. The environment should be kept comfortable and free of changes. After the training period, the listeners should settle into a comfortable understanding and consistency in taking the DRT. Therefore, very little in the way of recommendations on a standard set of instructions can be given to the listeners every time they come to take the test. They will know what their job is. All the administrator need do is remind them to pay consistent attention and how to score the answer sheet. They should become familiarized enough not to require detailed instructions for every session.

There are only two major areas that need refining to better implement the in-house DRT evaluation. The first area involves the discrimination between good

and bad listeners. A good listener is a consistent scorer. An inconsistent listener can not be used in the DRT program. A statistical test to define the limits of consistency has not been developed as of yet. Once criteria have been developed, the bad listeners can be identified and a pool of good listeners can be established for use in the in-house program.

The second area of research involves the tracking of listener performance. Once again, statistical tests have yet to be developed to record the on-going performance of the established listener pool. A statistical test to establish confidence intervals for each individual's performance must be developed to validate each listeners' performance during each DRT.

Once statistical tests to discriminate between consistent and inconsistent listeners and statistical tests to track each individual's performance are developed, the in-house capabilities for the DRT should be sufficient to conduct reliable testing.

References

1. Rosenthal, R. (1966) Experimental Effects in Behavioral Research, Appleton-Century-Crofts, New York.
2. Interview with W. D. Voiers on 28 Sept 1976 at Dynastat, Austin, Texas
3. Voiers, W. D. (1967) Performance Evaluation of Speech Processing Devices, III. Diagnostic Evaluation of Speech Intelligibility, Final Report, Contract No. AF19(628)4987.
4. Swets, J. A., and Kristofferson, A. B. (1970) Attention, Annual Review of Psychology, 21:339-366.
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